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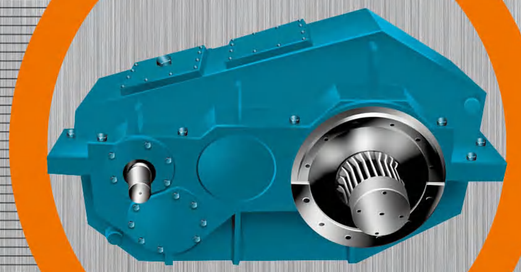

起重机用硬齿面减速器

TAILONG
MACHINERY

江苏泰隆机械集团公司
JIANGSU TAILONG MACHINERY GROUP COMPANY

江苏泰隆减速机股份有限公司
JIANGSU TAILONG DECELERATOR MACHINERY CO.,LTD.

中国驰名商标
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公司简介

泰隆集团地处扬子江畔的泰兴市区，是泰兴人引以为豪的国家大型企业。泰隆集团东临沪宁高速，西靠南京禄口机场，南有江阴大桥，交通便捷，物流畅通，具有得天独厚的区位优势。

集团在全国优秀企业家、江苏省劳动模范董事长殷根章的领导下，经过20多年的悉心经营，昂首迈进了中国机械工业500强，成为全国减变行业排头兵企业。集团现拥有总资产12.06亿元，固定资产6.92亿元，占地面积80万平方米，员工3162人，专业工程技术人员991人。拥有美国、德国、日本、俄罗斯、奥地利等国家引进的大型数控磨齿机、大型数控镗铣床，蜗杆磨床、加工中心、碳氮共渗炉等一批高精尖的生产设备和检测设备达48%。建立了全国同行业中检测功能最全、仪器最先进的2000kW测试中心，创建了江苏省技术中心、江苏省传动机械与控制工程技术研究中心、泰隆集团-哈工大工程技术研究中心、博士后科研工作站。公司的主导产品减速机在原有十几个系列，几十万种规格的基础上，采用先进的模块化、点线啮合等技术开发出了TL模块化齿轮减速电机、TXP行星模块化减速器、重载模块化齿轮减速器、点线啮合减速器、立式磨机及边缘传动磨机齿轮箱、铝冶行业的联合开卷卷取齿轮箱、三环减速器、星轮减速器、风电齿轮箱、水力发电变速装置、核电循环水泵驱动变速装置等高新技术产品，以及各类特殊非标齿轮箱。泰隆工业园区已经成为国内最大的钢帘线设备生产基地，双叶、三叶罗茨风机及高温风机批量出口东南亚及欧美。

我们的产品成功应用于中华世纪坛、三峡大坝、嫦娥一号发射、杭州湾跨海大桥，北京奥体馆、上海世博会等国家重点工程。重点客户有宝钢集团，首钢集团，上海振华港机，燕山石化，葛洲坝集团，北京水工，中国铝业，伊拉克泵站，桂林橡塑，乐山成发，三一重工等。

公司现为全国减速机标准化技术委员会秘书处单位，荣获“全国首批守合同重信用企业”、“国家重点高新技术企业”、“全国机械工业质量效益型先进企业”、“全国机械工业质量管理奖”、“全国用户满意服务”、“全国机械工业质量管理小组活动优秀企业”等殊誉。在同行业中率先通过了国家AAAA标准化良好行为企业认证、一级安全质量标准化机械制造企业认证，GB/T19022-2003完善计量检测体系认证、ISO9001-2008质量体系认证、ISO14001-2004环境体系认证、OHSAS18001-1999职业健康安全认证。产品通过矿用产品安全标志认证、起重行业型式试验认可认证，泰隆牌商标被国家工商总局认定为中国驰名商标，泰隆牌减速机被评为中国名牌产品。

泰隆人将遵循自己一贯的质量承诺、服务承诺和信誉承诺，把顾客满意当作我们的最高追求！

Company Brief

Tailong Group, located in Taixing city along riverside of the Yangzi River, is a national grant enterprise which Taixing people are proud of. Tailong Group is east to Highway of Shanghai-Nanjing, west to Nanjing Lukou airport and south to the Jiangyin Bridge. Convenient transportation and smooth physical distribution build the unparalleled location advantages for Tailong Group.

With effortful operation for over 20 years, Tailong Group, under leadership of national outstanding entrepreneur, chairman Mr. Yin genzhang, a model worker of Jiangsu Province, has developed in one of top 500 machinery industrial enterprises in China, playing a leading role in domestic reducer/transmission industry.

At present, the group has total assets of RMB1206million, and fixed assets of RMB 692 million, and it covers an area of 800,000 square meters and more than 3000 employees, where professional technicians account for 991. 48% of our equipments are sophisticated and advanced manufacturing equipments and testing equipments such as large CNS gear grinding machine, large CNC boring and milling machine, worm grinder, machining centre, and carbonitriding furnace that are imported from USA, Germany, Japan, Russia, Australia and so on. Diameter of machining work piece reaches 5m to the maximum. Single reducer we produced reaches 120 tons to the maximum. We have established a 2000kW testing center with most complete testing function and most advanced instruments of the industry national wide, and established a provincial engineering technical center, mechanical transmission and control Engineering Research Center of Jiangsu Province, Tailong Group - Harbin Technology Engineering Research Center and a post-doctoral research station. The dominant product, the reducer is available in decades of series and several hundred thousand specifications. Equipped with advanced modular and dot line engagement technology, we have additionally developed series of high tech products such as TL modular gear retarded machine, TXP modular planet reducer, heavy load modular gear retarded machine, dot line engaged reducer, vertical grinder and edge drive grinder gearbox, joint, open-book, take-up gearbox used for aluminum metallurgy industry, three ring gear reducer, planetary wheel speed reducer, wind driven gearbox, transmission for hydro-power generation, nuclear circling pump driven gearbox, and various special non-standard gearboxes. Tailong Industrial Park has become the largest steel cord production base of national wide. Our two-vane and three-vane Roots blowers and high temperature blower are exported to South East Asia, Europe and America in batches.

Our products are successfully used in the China Millennium Monument, the Three Gorges Dam, the Chang'e launch, Hangzhou Bay Bridge, Beijing Olympic Gymnasium, the Shanghai World Expo and other national key projects. Key customers include Baosteel Group, Shougang Group, Shanghai Zhenhua Port Machinery, Yanshan Petrochemical, Gezhouba Group, Beijing hydraulic, China aluminium, Iraqi pump station, Guilin Rubber, Leshan Chengfa, Sany Heavy Industry and so on.

The company is now a secretariat unit for national technical committee for standardization of reducer. We are ever granted as "national first contract respecting and credit-keeping enterprise", "national key high-tech enterprise", "national high quality and efficiency unit in machinery industry", "quality management award of national machinery industry", "national custom satisfied service", "excellent enterprise of quality management team activity of national machinery industry" and so on. We are certified as the good enterprise with better standardization with national AAAA certification and the first grade safety quality standardized machinery manufacturing enterprise and have passed such certifications as GB/T 19022-2003 perfect measurement test system, ISO 9001-2008 quality system, ISO 14001-2004 environment system, and OHSAS 18001-1999 occupational health and safety. Our products are certified with safety marks for mining products and recognized pass lifting industry type test. Tailong brand is recognized as the Chinese famous brand by national industrial and commercial bureau and Tailong reducer is awarded as the Chinese famous brand product.

Tailong people will keep to its persistent quality guarantee, service guarantee and credit, satisfying customer as our topmost pursuit.

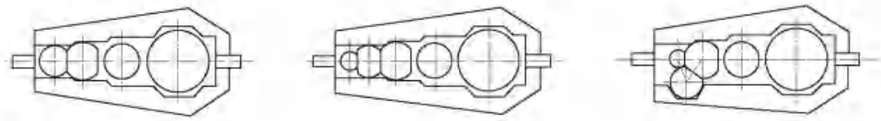
一、QY型起重机用硬齿面减速器

Hard tooth face decelerator for QY type hoist

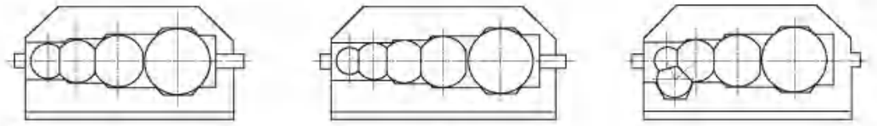
1、减速器的分类、应用范围 Classification and application scope of decelerator

QY型系列减速器包括QYS型（三支点）和QYD型（底座式）两个系列起重机用硬齿面减速器。它有三级、四级和三四级结合型三种，其结构简图见图1。

QY series decelerator includes hard tooth face decelerator for type QYS (3-supporting-point) and type QYD (pedestal type) hoists. It has 3-step, 4-step and 3 and 4 combined type, see figure 1 for structural diagram.



(a)



(b)

图1 QY型减速器结构简图：(a) QYS型；(b) QYD型

Figure 1 Type QY decelerator structural diagram: (a) type QYS; (b) type QYD

此减速器主要用于起重机各有关机构，也可用于运输、冶金、矿山、化工及轻工等机械设备的传动中。其工作条件为：

1) 齿轮圆周速度不大于20m/s;

2) 高速轴转速不大于1500r/min;

3) 工作环境温度为-40℃～+45℃;

4) 可正反两向运转。

This decelerator is mainly used for each of related mechanism on the hoist, also for the transmission of mechanical equipment in transportation, metallurgy, mining, chemical industry, and light industry with working condition as follows:

1) Peripheral speed of the gear wheel does not exceed 20m/s;

2) Rotating speed of high speed shaft does not exceed 1500r/min;

3) Working ambient temperature is -40℃～+45℃;

4) Both forward and backward rotation are available.

2、性能特点： Features:

考虑起重机各机构的工作特点、传动比范围、进一步提高产品性能，采用较少规格满足用户多方面的要求，其特点为：

1) 承载能力高。齿轮采用渗碳、淬火、磨齿加工、承载能力比调质滚齿的软齿面和中硬齿面齿轮减速器有大幅度提高。

2) 体积小、重量轻。与软齿面和中硬齿面减速器相比，相同承载能力减速器可降低2~4个相当机座号。

3) 效率高、噪声低、振动小。采用磨齿加工提高了精度等级，齿轮又进行了修缘，每级齿轮的综合效率为0.98，振动和噪声显著降低。

4) 采用多级数，减少单级速比，可拉开中心距、降低减速器整机高度，满足起重机各机构的要求；减速器的最大公称传动比达到400，满足了慢速起重机的要求。

5) 三支点减速器，可立式、卧式、甚至偏转一定角度安装，方便灵活。

6) 本系列减速器有三四级结合型（即三级的装配型式，四级的传动比）为慢速起重机的通用化提供了前提。

Based on the working characteristics of each mechanism on the hoist, scope of transmission rate, less specification is used to meet various requirements of the users while improving product performance with the features as follows:

1) Higher carrying capacity. The gear wheel is treated with carbonization, quenching, gear grinding to get much higher carrying capacity than soft tooth face and medium hard tooth face decelerator treated with hardening, tempering and hobbing;

2) Compact and light-weighted. Compared with soft tooth face and medium hard tooth face declerator, the decelerator with the same carrying capacity will have decreased pedestal number by 24 equivalent.

3) Higher efficiency, lower noise, and lower vibration. Gear grinding is introduced to increase grade of precision, and also the brim of gear wheel is trimmed, so the general efficiency of each step of hoist is 0.98, with much lower vibration and noise.

4) Multiple steps are introduced to decrease single step transmission ratio so as to widen the center distance, to decrease the overall height of the decelerator is up to 400 to meet the requirement of slow speed hoist.

5) 3-supporting-point decelerator can be installed vertically, horizontally, or in deflection by certain degrees, with much convenience and flexibility.

6) This series of decelerator has 3 and 4-step combined type (i.e., assembly form of 3-step with the transmission ratio of 4-step), providing the precondition for generalizing slow speed hoist.

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3、装配型式 Assembly form

两个系列的减速器装配型式相同，见图2

The two series decelerators have same assembly form as follows.

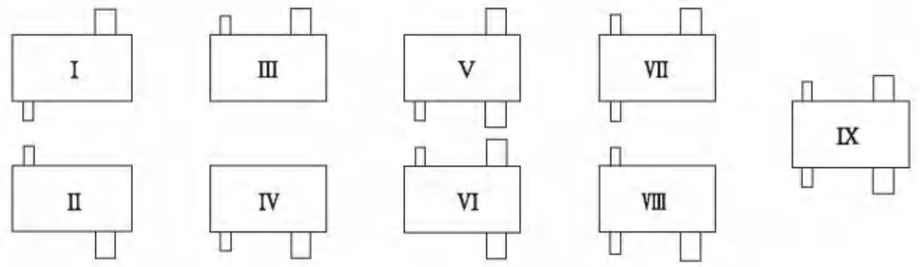


图2 减速器装配型式

Figure 2 Decelerator assembly form

4、安装型式 Installation form

QYS型减速器有卧式(W)、立式(L)或偏转±α角度的安装型式。注意浸油高度，保证润滑良好。见图3

Type QYS decelerator has 3 forms of installation: horizontal (W), vertical (L) and deflective by ±α, Make sure that the height of immersion oil is corrected for proper lubrication. See figure 3.

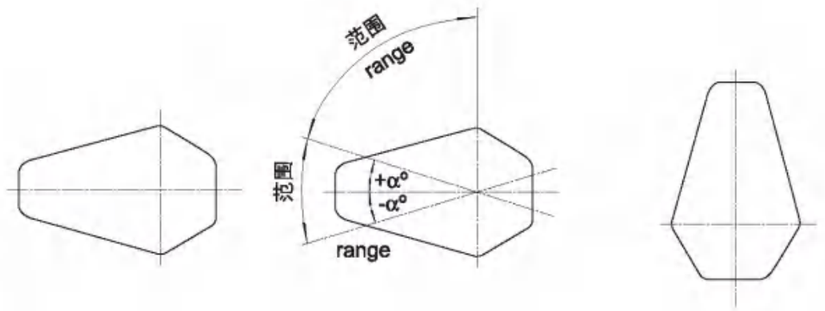


图3 QYS型减速器安装型式

Figure 3 Installation form of QYS type decelerator

QYS型减速器的支承型式见图4。

See figure 4 for the supporting form of type QYS decelerator.

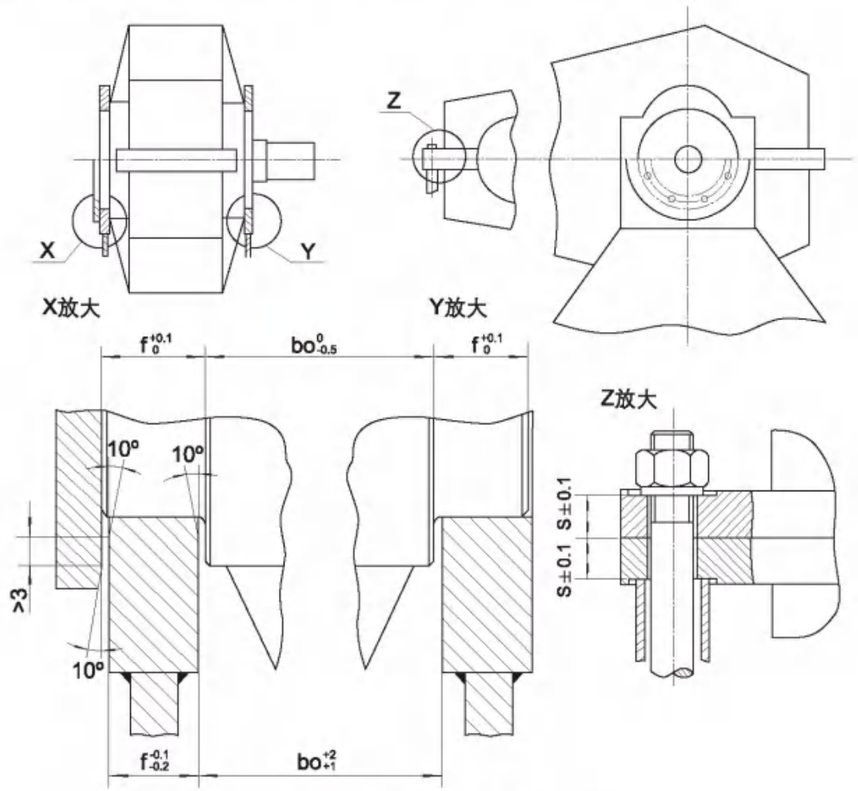


图4 QYS型减速器的支承型式

Figure 4 Supporting form of type QYS decelerator

QYD型减速器只有卧式

5、轴端型式 Shaft end mode

高速轴端采用圆柱轴伸，平键联接。

低速轴端有三种型式：

a. P型： 圆柱轴伸，平键、单键联接；

b. H型： 圆柱轴伸，渐开线花键联接；

c. C型： 齿轮轴端（仅名义中心距为180–560mm的减速器具有齿轮轴端）。低速轴端的型式和尺寸见图5和表1。

High–speed shaft end uses cylindrical shaft extension with flat key for connection.

Low–speed shaft end has 3 forms available as follows:

a. Type P: cylindrical shaft extension, flat key, single key for connection

b. Type H: cylindrical shaft extension, involute spline for connection

c. Type C: gearwheel shaft end (only the decelerator with nominal center distance of 180–560mm has gear wheel shaft end). See figure 5 and table 1 form and dimension of low–speed shaft end.

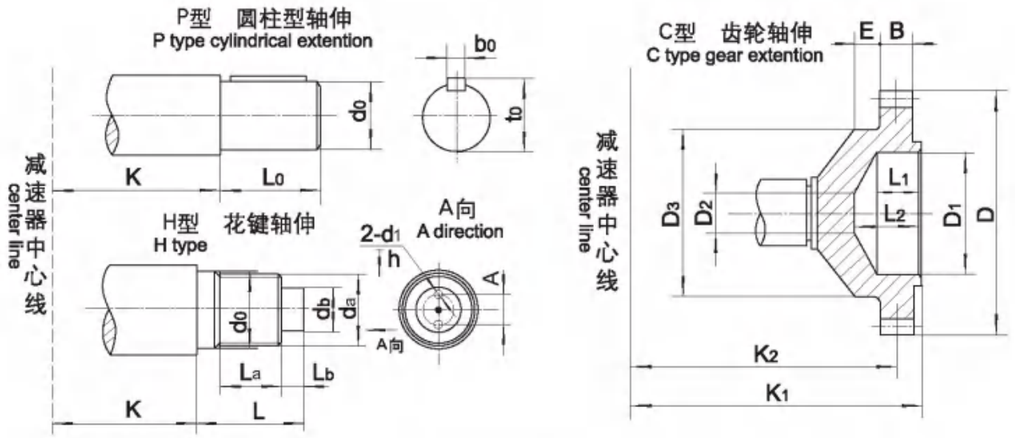
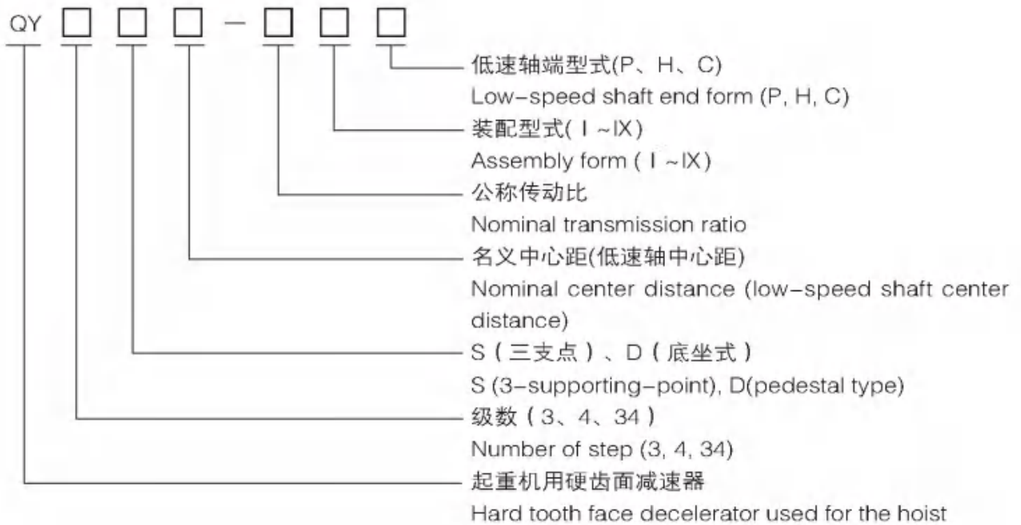


图5 低速轴端型式

Figure 5 Low–speed shaft end form

6、型号和标记 Model and notation

标记 Notation



标记示例：Example of notation:

1) 名义中心距a_1=315，公称传动比i=56，装配型式为Ⅲ，低速轴端为花键轴伸，起重机用三支点硬齿面三级减速器。

标记为：减速器QY3S315-56ⅢH。

2) 名义中心距a_1=450，公称传动比i=280，装配型式为Ⅱ，低速轴为齿轮轴端，起重机用底座式硬齿面四级减速器。

标记为：减速器QY4D450-280ⅡC。

1) Nominal center distance a_1=315, nominal transmission ratio i=56, assembly form is Ⅲ, low-speed shaft end is spline shaft extension, and the hoist uses 3-supporting-point hard tooth face 3-stage decelerator.

The notation is: Decelerator QY3S315-56ⅢH

2) Nominal center distance a_1=450, nominal transmission ratio i=280, assembly form is Ⅱ, low-speed shaft is gear shaft end, and the hoist uses pedestal type hard tooth face 4-step decelerator.

The notation is: Decelerator QY4D450-280ⅡC

7、传动比 Transmission ratio

QY3S、QY3D型减速器和QY4S、QY34S、QY4D、QY34D型减速器的公称传动比与实际传动比分别见表2和表3。

See table 2 and table 3 respectively for the nominal transmission ratio and actual transmission ratio of type QY3S, QY3D decelerators and type QY4S, QY34S, QY4D, QY34D decelerators.

表1 Table 1 mm

名义中心距 Nominal center distance α_1	K_S/K_D	P型 Type P				H型 Type H									
		d_0	L_0	b_0	t_0	m×z	d_a (h_{11})	d_b (k_S)	d_0 (k_D)	L	L_a	L_b	d_1	h	A
160	185/155	75	105	20	79.5	3X18	57	50	60	82	35	27	M6	16	25
180	195/165	90	130	25	95	3X22	69	60	70	90	40	30	M6	16	30
200	215/185	95	130	25	100	3X27	84	70	85	95	45	30	M10	20	35
225	230/205	100	165	28	106	5X18	95	80	100	125	55	35	M12	25	40
250	255/225	110	165	28	116	5X22	115	100	120	135	60	40	M12	25	40
280	270/250	130	200	32	137	5X22	115	100	120	135	60	40	M12	25	40
315	310/265	140	200	36	148	5X26	135	120	140	155	75	45	M12	25	50
355	335/290	170	240	40	179	5X30	155	140	160	165	80	50	M12	25	60
400	375/325	180	240	45	190	5X34	175	160	180	180	90	55	M16	30	80
450	415/365	220	280	50	231	5X38	195	180	200	190	100	55	M16	30	80
500	450/420	260	330	56	272	8X26	216	190	222	205	110	60	M16	30	110
560	510/460	280	380	63	292	8X30	248	220	254	220	125	60	M16	30	110
630	565/520	300	380	70	314	8X34	280	250	286	235	140	60	M16	30	140
710	600/550	340	450	80	355	8X38	312	280	318	260	155	70	M20	40	140
800	670/625	400	540	90	417	8X44	360	320	366	285	175	75	M20	40	160

名义中心距 Nominal center distance α_1	C型 Type C										
	mxz	D	D_1 (H_7)	K_1	K_2	B	E	D_2	D_3	L_1	L_2
160											
180	3X56	174	90	279.5	253	25	25	40	135	45	60
200	4X56	232	120	302.5	271	35	25	40	170	50	75
225	4X56	232	120	339.5	308	35	25	40	170	50	75
250	6X56	348	170	402	370	40	32	45	260	76	100
280	6X56	348	170	402	370	40	32	45	260	76	100
315	6X56	348	170	429	397	40	32	45	260	76	100
355	8X48	400	180	450	415	50	32	50	260	78	100
400	8X54	448	200	482	442	50	32	105	280	78	100
450	10X48	500	200	545	505	60	35	105	300	78	120
500	10X58	600	250	620	575	70	40	110	340	80	125
560	10X58	600	250	620	575	70	40	110	360	80	125
630	12X54	672	290	775	695	75	45	170	480	95	130
710											
800											

表中 In the talbe:

K_S——用于三支点减速器 K_S——for 3-supporting-point decelerator

K_D——用于底座式减速器 K_D——for pedestal type decelerator

表2 QY3S和QY3D型减速器的公称传动比与实际传动比

Table 2 Type QY3S and QY3D decelerators

传动比 Transmission ratio / 名义中心距 Nominal center distance α_1	公称传动比 Nominal transmission ratio															
	16	18	20	22.4	25	28	31.5	35.5	40	45	50	56	63	71	80	90
	实际传动比 Actual transmission ratio															
160	15.43	17.20	19.21	21.53	24.24	27.44	31.28	35.37	38.74	42.86	49.09	54.31	61.49	69.75	79.82	87.30
180	15.84	18.31	20.23	22.41	24.92	27.82	31.73	35.84	39.53	44.65	50.09	57.66	62.15	71.03	82.89	90.94
200	15.70	17.49	19.53	21.89	24.65	27.90	31.81	35.97	39.39	45.23	50.14	57.57	66.02	71.03	80.05	92.59
225	15.93	18.42	20.35	22.55	25.07	27.99	31.92	36.05	40.45	45.88	51.22	58.11	63.55	70.04	80.05	91.32
250	15.60	17.32	19.27	21.51	24.10	27.15	30.78	35.18	38.35	43.83	48.60	55.45	60.94	69.42	79.91	86.13
280	15.87	18.27	20.12	22.21	25.94	28.92	31.06	36.58	38.25	45.04	48.68	54.86	63.46	69.55	80.05	86.28
315	15.21	17.19	19.90	22.02	24.45	27.27	30.58	34.52	38.76	43.75	49.08	54.09	61.71	69.37	79.85	86.07
355	15.84	18.31	20.23	22.41	24.92	27.82	31.73	35.84	39.53	44.65	50.09	57.66	62.15	69.36	78.03	86.97
400	15.95	17.59	20.46	22.72	25.33	28.37	31.96	34.55	39.36	45.03	50.09	57.66	62.15	70.04	80.05	92.59
450	15.69	18.14	20.04	22.20	24.68	27.56	31.43	35.50	39.01	44.98	50.47	58.09	62.62	71.56	78.92	88.79
500	16.06	17.82	19.83	22.13	24.81	27.94	31.68	36.20	39.83	44.58	48.60	54.67	60.94	69.42	79.91	88.59
560	15.87	18.27	20.12	22.21	25.94	28.92	31.06	36.58	38.25	45.04	48.68	54.86	63.46	69.55	80.05	86.28
630	15.69	18.14	20.04	22.20	24.68	27.56	31.43	35.50	39.83	44.98	50.47	55.66	62.62	70.72	81.40	87.74
710	16.05	17.71	20.60	22.88	25.50	28.56	32.18	36.52	39.63	45.50	49.37	56.82	63.00	70.88	79.73	94.10
800	15.95	17.59	20.46	22.72	25.33	28.37	31.96	34.55	39.36	45.30	50.09	57.66	62.15	70.04	80.05	92.59

表3 QY4S、QY34S和QY4D、QY34D型减速器的公称传动比与实际传动比

Table 3 nominal transmission ratio and actual transmission ratio of type QY4S、QY34S and QY4D、QY34D decelerators

传动比 Transmission ratio / 名义中心距 Nominal center distance α_1	公称传动比 Nominal transmission ratio												
	100	112	125	140	160	180	200	224	250	280	315	355	400
	实际传动比 Actual transmission ratio												
200	102.99	114.44	127.79	143.57	162.50	177.99	203.34	229.16	245.96	282.43	304.13	351.79	403.39
225	100.82	114.14	130.11	147.11	161.13	180.79	200.02	220.45	249.59	283.12	309.66	354.33	404.24
250	97.41	108.77	124.04	140.10	157.20	171.37	197.25	227.03	244.72	279.68	306.87	358.09	385.99
280	99.46	112.60	128.36	145.13	158.96	171.82	197.29	222.35	254.96	293.46	315.75	340.35	393.67
315	95.61	106.76	121.75	137.51	154.28	173.07	196.32	216.37	236.65	272.39	310.75	355.15	382.81
355	98.22	110.65	125.44	143.34	156.26	175.33	200.38	225.42	247.34	284.69	306.87	349.60	389.68
400	100.97	112.56	120.92	142.38	153.90	175.33	197.59	222.69	257.58	296.48	319.57	350.21	405.09
450	101.63	113.36	127.13	143.52	160.99	180.63	199.08	219.55	250.47	288.30	310.75	349.34	393.01
500	97.41	108.77	124.04	140.10	157.20	171.37	197.25	221.90	239.19	275.31	307.23	342.46	379.68
560	102.21	114.48	128.98	139.41	158.82	171.67	197.59	222.69	240.03	276.28	315.75	340.35	393.67
630	98.30	109.76	125.17	141.37	158.62	177.98	204.85	225.92	243.51	280.29	315.32	345.28	388.44
710	100.10	112.76	127.83	146.08	159.25	172.79	194.39	218.69	243.76	280.57	311.06	354.38	418.24
800	100.97	112.56	120.92	142.38	153.90	175.33	197.59	222.69	257.58	296.48	319.57	350.21	405.09

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8、外形及安装尺寸 External and installation dimensions

QY3S减速器的外形及安装尺寸见图6和表4。
QY4S减速器的外形及安装尺寸见图8和表5。
QY34S减速器的外形及安装尺寸见图7和表6。
QY3D减速器的外形及安装尺寸见图9和表7。
QY4D减速器的外形及安装尺寸见图10和表8。
QY34D减速器的外形及安装尺寸见图11和表9。

See figure 6 and table 4 for the external and installation dimensions of QY3S decelerator.
See figure 8 and table 5 for the external and installation dimensions of QY4S decelerator.
See figure 7 and table 6 for the external and installation dimensions of QY34S decelerator.
See figure 9 and table 7 for the external and installation dimensions of QY3D decelerator.
See figure 10 and table 8 for the external and installation dimensions of QY4D decelerator.
See figure 11 and table 9 for the external and installation dimensions of QY34D decelerator.

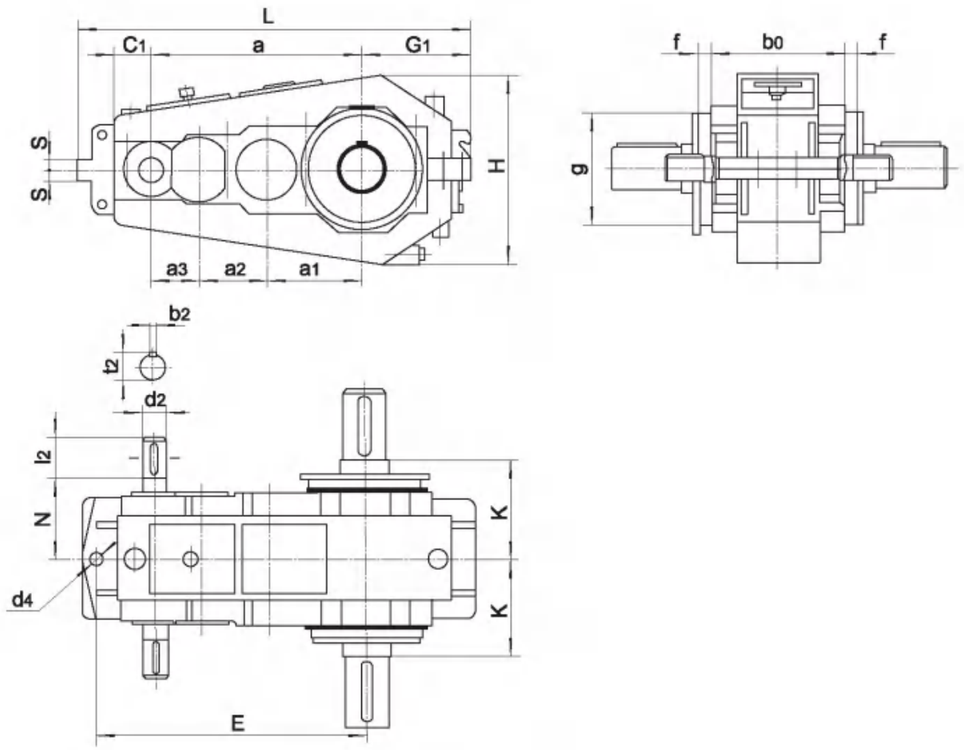

图6 QY3S减速器外形尺寸
Figure 6 External dimension of QY3S decelerator

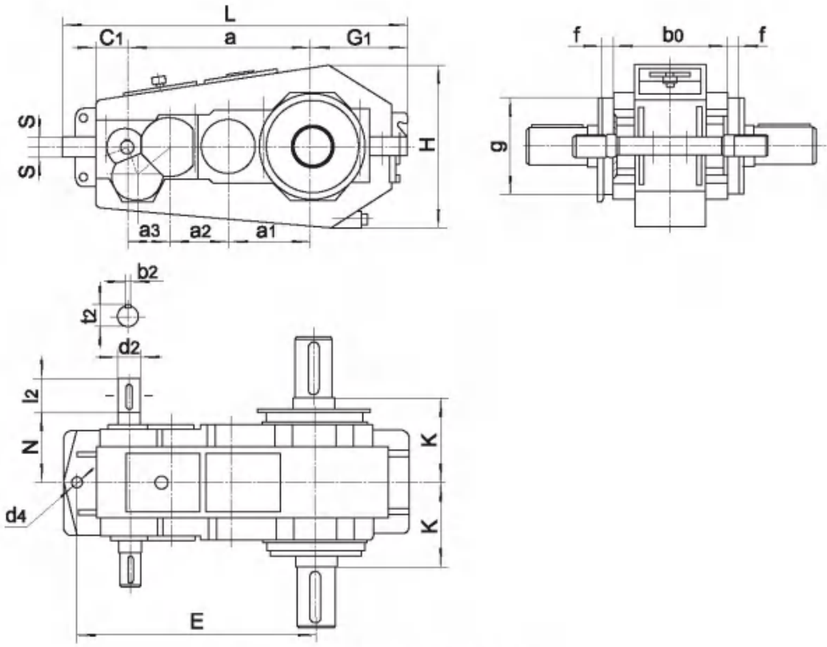

图7 QY34S减速器外形尺寸
Figure 7 External dimension of QY34S decelerator

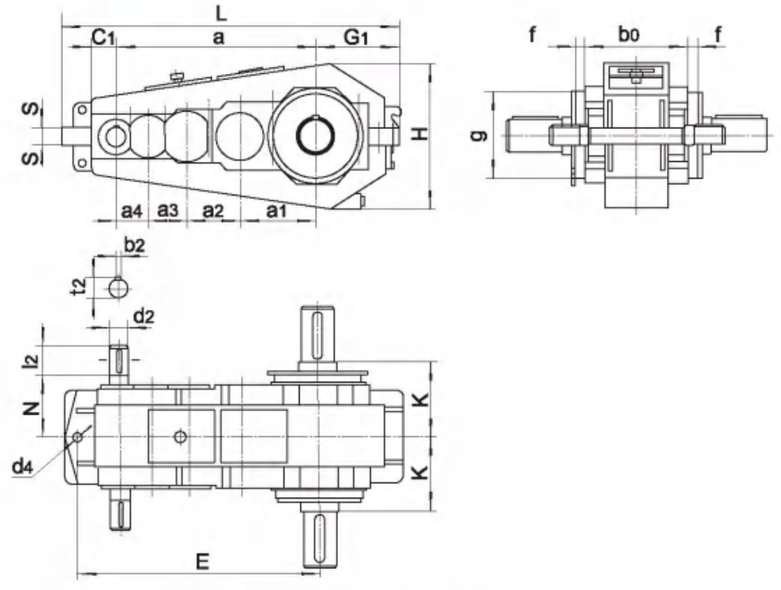

图8 QY4S减速器外形尺寸
Figure 8 External dimension of QY4S decelerator

表4 Table 4

mm

名 义 中心距 Nominal center distance α_1	a_2	a_3	a	N	输入轴端 Input shaft end i=16～90			
					d_2	l_2	b_2	t_2
160	112	80	352	135	24	50	8	27
180	125	90	395	145	28	60	8	31
200	140	100	440	160	32	80	10	35
225	160	112	497	175	38	80	10	41
250	180	125	555	195	42	110	12	45
280	200	140	620	210	48	110	14	51.5
					i=16～56		i=63～90	
					d_2	l_2	b_2	t_2	d_2	l_2	b_2	t_2
315	225	160	700	230	48	110	14	51.5	42	110	12	45
355	250	180	785	240	60	140	18	64	48	110	14	51.5
400	280	200	880	280	65	140	18	69	55	110	16	59
450	315	225	990	290	70	140	20	74.5	60	140	18	64
500	355	250	1105	325	80	170	22	85	65	140	18	69
560	400	280	1240	360	95	170	25	100	75	140	20	79.5
630	450	315	1395	410	110	210	28	116	85	170	22	90
710	500	355	1565	435	120	210	32	127	90	170	25	95
800	560	400	1760	490	140	250	36	148	100	210	28	106

名 义 中心距 Nominal center distance α_1	L	H	$b_0{}^{0}_{-0.5}$	$f_0^{+0.1}$	g (h_9)	d_4	E (Js14)	S	G_1	C_1	K	重量 Weight (kg)
160	670	314	250	18	190	22	457	20	183	60	185	158
180	740	354	270	20	220	22	505	20	205	65	195	204
200	825	394	285	20	240	26	565	25	225	80	215	260
225	925	434	320	20	260	26	637	25	253	86	230	352
250	1020	482	360	25	270	33	705	30	275	96	255	477
280	1128	534	385	25	320	33	780	30	300	101	270	637
315	1302	622	425	25	340	40	890	35	355	118	310	876
355	1432	696	470	30	390	40	985	35	390	128	335	1174
400	1602	780	535	30	440	45	1105	40	435	148	375	1680
450	1772	880	600	40	520	45	1225	40	485	155	415	2402
500	1990	970	660	40	600	52	1375	45	540	180	450	3275
560	2185	1070	730	40	640	52	1525	45	585	192	510	4434
630	2445	1240	815	50	640	62	1700	50	665	212	565	6105
710	2735	1392	880	50	680	62	1900	60	750	229	600	8168
800	3075	1580	985	60	800	70	2125	60	850	249	670	11656

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表5 Table 5

mm

名 义 中心距 Nominal center distance α_1	a_2	a_3	a_4	a	N	输入轴端 Input shaft end i=100～400			
						d_2	l_2	b_2	t_2
200	140	100	71	511	160	19	40	6	21.5
225	160	112	80	577	175	24	50	8	27
250	180	125	90	645	195	28	60	8	31
280	200	140	100	720	210	32	80	10	35
315	225	160	112	812	230	38	80	10	41
355	250	180	125	910	240	42	110	12	45
						i=100～224		i=250～400	
						d_2	l_2	b_2	t_2	d_2	l_2	b_2	t_2
400	280	200	140	1020	280	48	110	14	51.5	38	80	10	41
450	315	225	160	1150	290	48	110	14	51.5	42	110	12	45
500	355	250	180	1285	325	60	140	18	64	48	110	14	51.5
560	400	280	200	1440	360	65	140	18	69	55	110	16	59
630	450	315	225	1620	410	70	140	20	74.5	60	140	18	64
710	500	355	250	1815	435	80	170	22	85	65	140	18	69
800	560	400	280	2040	490	95	170	25	100	70	140	20	74.5

名 义 中心距 Nominal center distance α_1	L	H	$b_0{}^{0}_{-0.5}$	$f_0^{+0.1}$	g (h_9)	d_4	E (Js14)	S	G_1	C_1	K	重量 Weight (kg)
200	875	394	285	20	240	26	616	25	225	60	215	266
225	990	434	320	20	260	26	702	25	253	71	230	363
250	1085	482	360	25	270	33	770	30	275	71	255	493
280	1203	534	385	25	320	33	855	30	300	76	270	660
315	1382	622	425	25	340	40	982	35	355	98	310	913
355	1532	696	470	30	390	40	1085	35	390	103	335	1217
400	1707	780	535	30	440	45	1210	40	435	113	375	1762
450	1897	880	600	40	520	45	1350	40	485	120	415	2482
500	2135	970	660	40	600	52	1520	45	540	145	450	3380
560	2345	1070	730	40	640	52	1685	45	585	152	510	4571
630	2630	1240	815	50	640	62	1885	50	665	172	565	6375
710	2940	1392	880	50	680	62	2105	60	750	184	600	8468
800	3315	1580	985	60	800	70	2365	60	850	209	670	12066

表6 Table 6 mm

名 义 中心距 Nominal center distance α_t	a_2	a_3	a_4	a	N	输入轴端 Input shaft end i=100～400			
						d_2	l_2	b_2	t_2
200	140	100	71	440	160	19	40	6	21.5
225	160	112	80	497	175	24	50	8	27
250	180	125	90	555	195	28	60	8	31
280	200	140	100	620	210	32	80	10	35
315	225	160	112	700	230	38	80	10	41
355	250	180	125	785	240	42	110	12	45
						i=100～224				i=250～400			
						d_2	l_2	b_2	t_2	d_2	l_2	b_2	t_2
400	280	200	140	880	280	48	110	14	51.5	38	80	10	41
450	315	225	160	990	290	48	110	14	51.5	42	110	12	45
500	355	250	180	1105	325	60	140	18	64	48	110	14	51.5
560	400	280	200	1240	360	65	140	18	69	55	110	16	59
630	450	315	225	1395	410	70	140	20	74.5	60	140	18	64
710	500	355	250	1565	435	80	170	22	85	65	140	18	69
800	560	400	280	1760	490	95	170	25	100	70	140	20	74.5

名 义 中心距 Nominal center distance α_t	L	H	b_0 $^{0}_{-0.5}$	$f_0^{+0.1}$	g (h_9)	d_4	E (Js14)	S	G_1	C_1	K	重量 Weight (kg)
200	825	394	285	20	240	26	565	25	225	80	215	271
225	925	434	320	20	260	26	637	25	253	86	230	364
250	1020	482	360	25	270	33	705	30	275	96	255	494
280	1128	534	385	25	320	33	780	30	300	101	270	663
315	1302	622	425	25	340	40	890	35	355	118	310	916
355	1432	696	470	30	390	40	985	35	390	128	335	1220
400	1602	780	535	30	440	45	1105	40	435	148	375	1760
450	1772	880	600	40	520	45	1225	40	485	155	415	2502
500	1990	970	660	40	600	52	1375	45	540	180	450	3393
560	2185	1070	730	40	640	52	1525	45	585	192	510	4708
630	2445	1240	815	50	640	62	1700	50	665	212	565	6293
710	2735	1392	880	50	680	62	1900	60	750	229	600	8502
800	3075	1580	985	60	800	70	2125	60	850	249	670	12124

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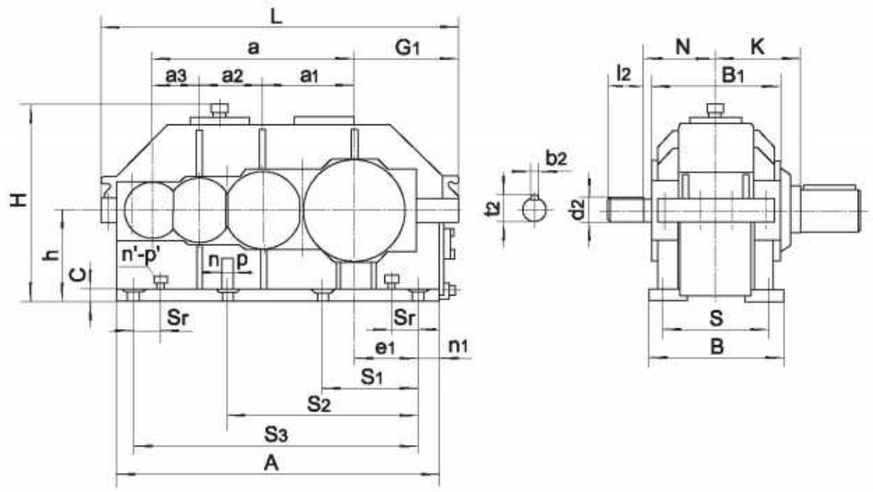

图9 QY3D减速器外形尺寸

Figure 9 External dimension of QY3D decelerator

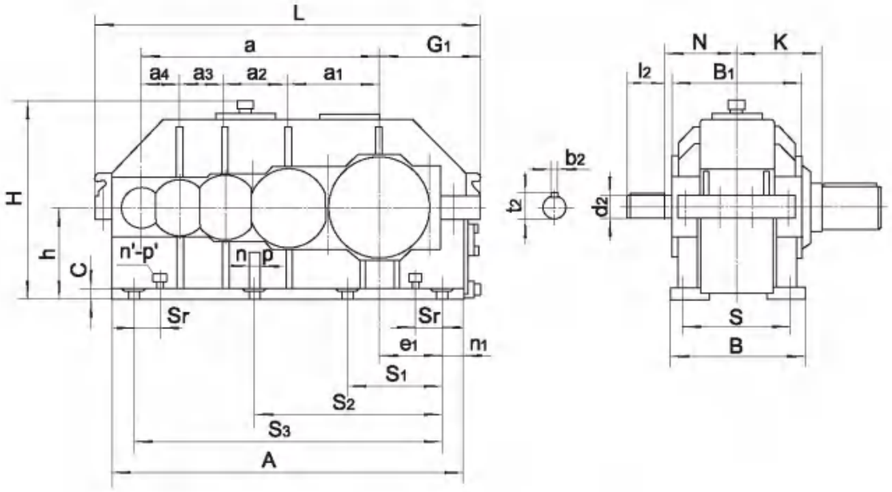

图10 QY4D减速器外形尺寸

Figure 10 External dimension of QY4D decelerator

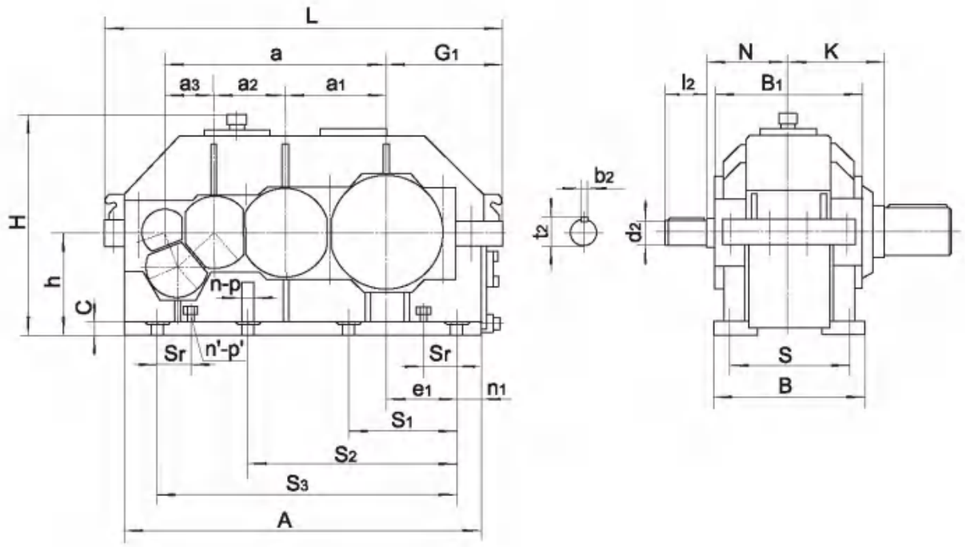

图11 QY34D减速器外形尺寸

Figure 11 External dimension of QY34D decelerator

表7 Table 7

mm

名义中心距 Nominal center distance α_1	a_2	a_3	a	N	输入轴端 Input shaft end i=16～90			
					d_2	l_2	b_2	t_2
160	112	80	352	135	24	50	8	27
180	125	90	395	145	28	60	8	31
200	140	100	440	160	32	80	10	35
225	160	112	497	175	38	80	10	41
250	180	125	555	195	42	110	12	45
280	200	140	620	210	48	110	14	51.5
					i=16～56			
					d_2	l_2	b_2	t_2
315	225	160	700	230	48	110	14	51.5
355	250	180	785	240	60	140	18	64
400	280	200	880	280	65	140	18	69
450	315	225	990	290	70	140	20	74.5
500	355	250	1105	325	80	170	22	85
560	400	280	1240	360	95	170	25	100
630	450	315	1395	410	110	210	28	116
710	500	355	1565	435	120	210	32	127
800	560	400	1760	490	140	250	36	148

输入轴端 Input shaft end i=63～90				名义中心距 Nominal center distance α_1	外形尺寸 External dimension			中心高 Center height h	地脚安装尺寸 Holding-down installation dimension						
d_2	l_2	b_2	t_2		L	H	B		S	S_1	S_2	S_3	c	P	n
42	110	12	45	160	630	352	250	160	200	250	500		20	18	6
48	110	14	51.5	180	700	394	265	180	215	280	560		20	18	6
i=63～90				200	780	431	295	200	235	310	620		25	22	6
d_2	l_2	b_2	t_2	225	880	479	320	225	260	350	700		25	22	6
48	110	14	51.5	250	970	524	360	250	290	390	780		30	26	6
60	140	18	64	280	1081	579	400	280	325	435	875		30	26	6
65	140	18	69	315	1230	659	445	315	365	500	1000		35	33	6
70	140	20	74.5	355	1384	736	470	355	390	565	1130		35	33	6
80	170	22	85	400	1549	821	520	400	430	455	845	1265	40	40	8
95	170	25	100	450	1719	980	570	450	480	500	950	1425	40	40	8
110	210	28	116	500	1930	1075	630	500	530	575	1060	1590	50	45	8
120	210	32	127	560	2120	1185	700	560	600	620	1190	1780	50	45	8
140	250	36	148	630	2375	1335	800	630	680	690	1350	2015	60	52	8
				710	2670	1487	850	710	730	755	1515	2270	60	52	8
				800	2995	1669	960	800	830	845	1690	2535	70	62	8

名义中心距 Nominal center distance α_1	调整螺栓 Adjustment bolt			A	B_1	G_1	n_1	e_1	重量 Weight (kg)
	S_r	P'	n'						
160				550	220	183	25	118	158
180				620	235	205	30	135	199
200				700	265	225	40	145	260
225				780	290	253	40	163	361
250				870	340	275	45	180	502
280				965	375	300	45	205	678
315				1100	405	355	50	240	917
355	120	M24	4	1230	460	390	50	275	1237
400	140	M24	4	1385	515	435	60	305	1726
450	150	M30	4	1545	590	485	60	350	2567
500	170	M30	4	1730	660	540	70	385	3522
560	180	M36	4	1920	730	585	70	430	4692
630	200	M36	4	2175	835	665	80	500	6476
710	220	M42	4	2430	890	750	80	570	8674
800	240	M42	4	2735	1030	850	100	640	12560

表8 Table 8

mm

名义中心距 Nominal center distance a_1	a_2	a_3	a_4	a	N	输入轴端 Input shaft end i=100～400			
						d_2	l_2	b_2	t_2
200	140	100	71	511	160	19	40	6	21.5
225	160	112	80	577	175	24	50	8	27
250	180	125	90	645	195	28	60	8	31
280	200	140	100	720	210	32	80	10	35
315	225	160	112	812	230	38	80	10	41
355	250	180	125	910	240	42	110	12	45
						i=100～224		i=250～400	
						d_2	l_2	b_2	t_2	d_2	l_2	b_2	t_2
400	280	200	140	1020	280	48	110	14	51.5	38	80	10	41
450	315	225	160	1150	290	48	110	14	51.5	42	110	12	45
500	355	250	180	1285	325	60	140	18	64	48	110	14	51.5
560	400	280	200	1440	360	65	140	18	69	55	110	16	59
630	450	315	225	1620	410	70	140	20	74.5	60	140	18	64
710	500	355	250	1815	435	80	170	22	85	65	140	18	69
800	560	400	280	2040	490	95	170	25	100	70	140	20	74.5

名义中心距 Nominal center distance a_1	外形尺寸 External dimension			中心高 Center height h	地脚安装尺寸 Holding-down installation dimension						
	L	H	B		S	S_1	S_2	S_3	c	P	n
200	831	431	295	200	235	310	671		25	22	6
225	945	479	320	225	260	350	700		25	22	6
250	1035	524	360	250	290	390	845		30	26	6
280	1156	579	400	280	325	435	950		30	26	6
315	1322	659	445	315	365	518	1092		35	33	6
355	1484	736	470	355	390	565	1230		35	33	6
400	1654	821	520	400	430	455	915	1370	40	40	8
450	1844	980	570	450	480	515	1035	1550	40	40	8
500	2075	1075	630	500	530	575	1160	1735	50	45	8
560	2270	1185	700	560	600	650	1290	1940	50	45	8
630	2560	1335	800	630	680	730	1470	2200	60	52	8
710	2875	1487	850	710	730	825	1650	2475	60	52	8
800	3235	1669	960	800	830	925	1850	2775	70	62	8

名义中心距 Nominal center distance a_1	调整螺栓 Adjustment bolt			A	B_1	G_1	n_1	e_1	重量 Weight (kg)
	S_1	P'	n'						
200				751	265	225	40	145	286
225				845	290	253	40	163	378
250				935	340	275	45	180	523
280				1040	375	300	45	205	698
315				1192	405	355	50	240	968
355	100	M24	4	1330	460	390	50	275	1280
400	110	M24	4	1490	515	435	60	305	1831
450	130	M30	4	1670	590	485	60	350	2675
500	150	M30	4	1875	660	540	70	385	3597
560	160	M36	4	2080	730	585	70	430	4915
630	195	M36	4	2360	835	665	80	500	6572
710	190	M42	4	2635	890	750	80	570	9160
800	240	M42	4	2975	1030	850	100	640	13605

表9 Table 9

mm

名义中心距 Nominal center distance a_1	a_2	a_3	a_4	a	N	输入轴端 Input shaft end i=100～400			
						d_2	l_2	b_2	t_2
200	140	100	71	440	160	19	40	6	21.5
225	160	112	80	497	175	24	50	8	27
250	180	125	90	555	195	28	60	8	31
280	200	140	100	620	210	32	80	10	35
315	225	160	112	700	230	38	80	10	41
355	250	180	125	785	240	42	110	12	45
						i=100～224		i=250～400	
						d_2	l_2	b_2	t_2	d_2	l_2	b_2	t_2
400	280	200	140	880	280	48	110	14	51.5	38	80	10	41
450	315	225	160	990	290	48	110	14	51.5	42	110	12	45
500	355	250	180	1105	325	60	140	18	64	48	110	14	51.5
560	400	280	200	1240	360	65	140	18	69	55	110	16	59
630	450	315	225	1395	410	70	140	20	74.5	60	140	18	64
710	500	355	250	1565	435	80	170	22	85	65	140	18	69
800	560	400	280	1760	490	95	170	25	100	70	140	20	74.5

名义中心距 Nominal center distance a_1	外形尺寸 External dimension			中心高 Center height h	地脚安装尺寸 Holding-down installation dimension						
	L	H	B		S	S_1	S_2	S_3	c	P	n
200	780	431	295	200	235	310	620		25	22	6
225	880	479	320	225	260	350	700		25	22	6
250	970	524	360	250	290	390	780		30	26	6
280	1081	579	400	280	325	435	875		30	26	6
315	1230	659	445	315	365	500	1000		35	33	6
355	1384	736	470	355	390	565	1130		35	33	6
400	1549	821	520	400	430	455	845	1265	40	40	8
450	1719	980	570	450	480	500	950	1425	40	40	8
500	1930	1075	630	500	530	575	1060	1590	50	45	8
560	2120	1185	700	560	600	620	1190	1780	50	45	8
630	2375	1335	800	630	680	690	1350	2015	60	52	8
710	2670	1487	850	710	730	755	1515	2270	60	52	8
800	2995	1669	960	800	830	845	1690	2535	70	62	8

名义中心距 Nominal center distance a_1	调整螺栓 Adjustment bolt			A	B_1	G_1	n_1	e_1	重量 Weight (kg)
	S_1	P'	n'						
200				700	265	225	40	145	272
225				780	290	253	40	163	372
250				870	340	275	45	180	521
280				965	375	300	45	205	708
315				1100	405	355	50	240	965
355	160	M24	4	1230	460	390	50	275	1295
400	180	M24	4	1385	515	435	60	305	1813
450	200	M30	4	1545	590	485	60	350	2677
500	225	M30	4	1730	660	540	70	385	3660
560	110	M36	4	1920	730	585	70	430	4864
630	120	M36	4	2175	835	665	80	500	6740
710	295	M42	4	2430	890	750	80	570	8980
800	380(240)	M42	4	2735	1030	850	100	640	12976

9、承载能力 Carrying capacity

QY3S和QY3D减速器的公称输入功率见表10。

QY4S、QY34S和QY4D、QY34D减速器的公称输入功率见表11。

See table 10 for the nominal input power of QY3S and QY3D decelerators.

See table 11 for the nominal input power of QY4S, QY34S and QY4D, QY34D decelerators.

表10 Table 10

输入轴转速 Input shaft rotating speed (r/min)	名义中心距 Nominal center distance a_1 (mm)	输出转矩 Output torque (Nm)	公称传动比 Nominal transmission ratio														
			16.0	18.0	20.0	22.4	25.0	28.0	31.5	35.5	40.0	45.0	50.0	56.0	63.0	71.0	80.0	90.0
			公称输入功率 Nominal input power (kw)															
	160	2800	9.5	9.0	8.4	7.9	7.3	6.7	5.9	5.2	4.6	4.1	3.7	2.9	2.7	2.6	2.4	2.1
	180	3800	11.8	11.0	10.4	9.8	9.2	8.6	8.6	7.9	7.0	6.2	5.5	4.8	4.5	3.9	3.2	3.1
	200	6300	21.9	20.6	19.3	18.0	16.5	14.5	12.8	11.4	10.1	9.0	8.2	7.1	6.2	5.5	5.1	4.4
	225	8800	27.7	25.6	24.2	22.8	21.3	19.9	17.8	15.9	14.2	12.6	11.2	9.9	9.0	8.2	7.2	6.3
	250	13400	47.6	45.0	42.3	39.6	36.8	30.8	27.1	23.8	21.4	18.8	17.2	15.1	13.7	11.9	10.5	9.7
	280	16500	54.6	50.9	47.9	45.2	41.3	37.0	34.5	29.5	28.2	24.0	22.2	19.7	17.0	14.8	13.5	12.5
	315	25000	92.8	86.2	76.1	68.8	62.0	55.6	49.6	44.4	39.6	35.1	31.3	28.4	24.9	21.6	19.2	17.9
600	355	37000	127.5	118.6	112.4	105.3	94.8	84.9	74.5	66.0	59.9	53.1	47.5	41.1	38.2	33.9	30.4	27.3
	400	53000	181.3	172.7	159.1	146.6	131.6	117.6	104.5	92.8	82.8	73.0	67.3	58.5	54.3	48.2	42.2	36.5
	450	72000	270.2	247.7	224.5	202.9	182.6	163.7	143.7	128.4	114.5	101.5	90.5	78.7	73.0	63.4	55.5	51.5
	500	102000	392.8	354.4	318.9	286.0	255.5	227.0	200.4	175.5	163.0	142.7	131.0	116.5	104.5	90.9	79.8	72.0
	560	128000	498.4	443.8	403.6	366.0	314.0	282.0	262.7	224.7	214.9	182.7	169.1	150.2	129.9	112.9	103.1	95.6
	630	185000	729.3	635.5	576.1	520.8	469.0	420.6	369.3	330.1	294.5	260.9	232.7	202.3	187.8	163.3	144.6	134.2
	710	252000	995.6	904.3	779.2	702.9	631.5	564.6	502.1	446.9	407.5	359.4	331.4	288.2	260.1	231.3	205.7	174.4
	800	355000	1403.9	1275.5	1099.5	992.0	891.4	797.1	708.6	629.7	562.2	495.8	457.3	397.7	369.1	327.8	287.0	248.3
	160	2800	11.9	11.2	10.5	9.8	9.1	8.4	7.3	6.5	5.8	5.1	4.7	3.6	3.3	3.2	3.0	2.6
	180	3800	14.8	13.7	13.0	12.2	11.5	10.7	10.7	9.8	8.8	7.8	6.9	6.0	5.6	4.9	4.0	3.8
	200	6300	27.3	25.7	24.1	22.5	20.6	18.2	16.0	14.2	12.6	11.2	10.2	8.9	7.8	6.9	6.4	5.5
	225	8800	34.6	32.0	30.3	28.5	26.7	24.8	22.3	19.9	17.8	15.7	14.0	12.4	11.3	10.3	9.0	7.9
	250	13400	59.5	56.2	52.9	49.5	46.1	38.4	33.9	29.7	26.8	23.5	21.5	18.8	17.2	14.9	13.1	12.2
	280	16500	68.3	63.6	59.9	56.6	51.6	46.3	43.1	36.9	35.3	30.0	27.7	24.6	21.3	18.5	16.9	15.7
	315	25000	116.0	107.8	95.1	86.6	77.5	69.6	62.1	55.5	49.5	43.8	39.1	35.5	31.1	27.0	24.1	22.3
750	355	37000	159.4	148.2	140.5	131.6	118.5	106.2	93.2	82.5	74.9	66.3	59.1	51.4	47.7	42.4	38.0	34.1
	400	53000	226.7	215.8	198.9	183.2	164.5	147.0	130.6	116.0	103.5	91.2	84.1	73.1	67.9	60.2	52.7	45.6
	450	72000	337.7	309.7	280.6	253.6	228.3	204.6	179.6	160.6	143.2	126.8	113.1	98.3	91.2	79.3	69.4	64.4
	500	102000	491.0	443.0	398.7	357.6	319.4	283.8	250.5	219.4	203.7	178.4	163.4	145.6	130.7	113.6	99.7	90.0
	560	128000	623.0	554.8	504.5	457.5	392.5	352.5	328.3	280.8	268.6	228.4	211.4	187.7	162.4	141.2	128.8	119.6
	630	185000	911.6	794.3	720.1	650.9	586.3	525.7	461.6	412.6	368.1	326.2	290.9	252.9	234.7	204.1	180.8	167.7
	710	252000	1244.5	1130.4	974.1	878.6	789.3	705.7	627.6	558.7	509.4	449.2	414.3	360.2	325.1	289.1	257.2	218.0
	800	355000	1754.9	1594.4	1374.4	1240.0	1114.3	996.4	885.7	787.1	702.7	619.8	571.6	497.1	461.4	409.7	358.7	310.3

表10 (续) Table 10 (finished)

输入轴转速 Input shaft rotating speed (r/min)	名义中心距 Nominal center distance a_1 (mm)	输出转矩 Output torque (Nm)	公称传动比 Nominal transmission ratio														
			16.0	18.0	20.0	22.4	25.0	28.0	31.5	35.5	40.0	45.0	50.0	56.0	63.0	71.0	80.0	90.0
			公称输入功率 Nominal input power (kw)															
	160	2800	15.9	15.0	14.1	13.1	12.2	11.2	9.8	8.7	7.7	6.8	6.2	4.8	4.4	4.3	4.0	3.5
	180	3800	19.7	18.3	17.3	16.3	15.3	14.3	14.3	13.1	11.7	40.4	9.2	8.0	7.5	6.5	5.4	5.2
	200	6300	36.4	34.3	32.2	30.0	27.4	24.2	21.3	19.0	16.9	14.9	13.6	11.9	10.4	9.2	8.5	7.4
	225	8800	46.1	42.7	40.4	38.0	35.6	33.1	29.7	26.5	23.7	21.0	18.7	16.5	15.1	13.7	12.0	10.5
	250	13400	79.3	75.0	70.5	66.0	61.4	51.3	45.2	39.6	35.7	31.3	28.7	25.1	22.9	19.9	17.5	16.2
	280	16500	91.1	84.8	79.8	75.4	68.8	61.7	57.5	49.1	47.0	39.9	37.0	32.8	28.4	24.7	22.5	20.9
	315	25000	154.7	143.7	126.9	114.7	103.4	92.7	82.7	74.0	66.0	58.4	52.1	47.3	41.5	36.0	32.1	29.8
1000	355	37000	212.6	197.7	187.3	175.5	158.0	141.6	124.2	110.0	99.8	88.4	78.8	68.5	63.6	56.5	50.7	45.5
	400	53000	302.2	287.8	265.2	244.3	219.4	196.0	174.1	154.7	138.0	121.7	112.2	97.5	90.5	80.3	70.3	60.8
	450	72000	450.3	412.9	374.2	338.1	304.4	272.8	239.5	214.1	190.9	169.1	150.8	131.1	121.7	105.7	92.6	85.9
	500	102000	654.7	590.7	531.5	476.7	425.8	378.4	334.1	292.6	271.6	237.9	218.3	194.1	174.2	151.4	133.0	120.0
	560	128000	830.7	739.7	672.7	610.0	523.4	470.0	437.8	374.5	358.2	304.5	281.9	250.3	216.5	188.2	171.8	159.4
	630	185000	1215.5	1059.1	960.2	867.9	781.7	700.9	615.4	550.2	490.8	434.9	387.9	337.2	313.0	272.1	241.0	223.7
	710	252000	1659.3	1507.2	1298.7	1171.5	1052.5	940.9	836.8	744.9	679.1	599.0	552.4	480.3	433.5	385.5	342.9	290.7
	800	355000	2339.8	2125.8	1832.6	1653.4	1485.7	1328.6	1180.9	1049.5	936.9	826.3	762.2	662.8	615.1	546.3	478.3	413.8
	160	2800	23.8	22.5	21.1	19.7	19.3	16.7	14.7	13.0	11.6	10.3	9.4	7.3	6.6	6.5	6.0	5.3
	180	3800	29.5	27.4	25.9	24.5	22.9	21.4	21.4	19.7	17.6	15.6	13.9	12.1	11.2	9.8	8.0	8.0
	200	6300	54.6	51.5	48.3	45.0	41.1	36.4	31.9	28.5	25.3	22.4	20.4	17.8	15.5	13.8	12.8	11.1
	225	8800	69.2	64.0	60.5	57.0	53.4	49.7	44.5	39.8	35.5	31.5	28.0	24.7	22.6	20.5	18.0	15.7
	250	13400	119.0	112.4	105.8	99.0	92.1	76.9	67.9	59.4	53.6	46.9	43.0	37.7	34.3	29.8	26.2	24.3
	280	16500	136.6	127.2	119.7	113.0	103.1	92.6	86.2	73.7	70.5	59.9	55.4	49.2	42.6	37.0	33.8	31.3
	315	25000	232.0	215.6	190.3	172.1	155.1	155.1	139.1	111.0	98.9	87.7	78.2	71.0	62.2	54.1	48.1	44.6
1500	355	37000	318.9	296.5	280.9	263.2	236.9	212.3	186.3	165.1	149.7	132.6	118.3	102.8	95.4	84.8	76.0	68.2
	400	53000	453.3	431.7	397.8	366.5	329.0	294.0	261.1	232.0	207.0	182.5	168.2	146.2	135.7	120.5	105.4	91.2
	450	72000	675.5	619.3	561.3	507.1	456.6	409.3	359.2	321.1	286.4	253.7	226.2	196.6	182.5	158.6	138.8	128.8
	500	102000	982.0	886.0	797.3	715.1	638.7	567.6	501.1	438.9	407.4	356.8	327.4	291.2	261.3	227.2	199.5	180.0
	560	128000	1246.0	1109.5	1009.0	915.0	785.0	704.9	656.7	561.7	537.3	456.8	422.8	375.4	324.8	282.3	257.7	239.1
	630	185000	1823.2	1588.6	1440.3	1301.9	1172.5	1051.4	923.1	825.2	736.2	652.3	581.8	505.9	469.4	408.1	361.5	335.5
	710	252000	2489.0	2260.7	1948.1	1757.2	1578.7	1400.4	1255.2	1117.3	1018.7	898.7	828.6	720.5	650.2	578.3	514.3	436.1
	800	355000	3509.7	3188.8	2748.9	2480.0	2228.6	1992.8	1771.4	1574.3	1405.4	1239.5	1143.3	994.2	922.7	819.4	717.5	620.7

TAILONG MACHINERY

表11　Table 11

输入轴转速 Input shaft rotating speed (r/min)	名义中心距 Nominal center distance a_n (mm)	输出转矩 Output torque (Nm)	公称传动比 Nominal transmission ratio											
			100.0	112.0	125.0	140.0	160.0	180.0	200.0	224.0	250.0	280.0	315.0	355.0	400.0
			公称输入功率 Nominal input power (kw)												
	200	6300	3.3	3.1	2.9	2.6	2.4	2.3	2.2	2.0	1.8	1.6	1.4	1.3	1.1
	225	8800	5.7	5.0	4.4	4.0	3.7	3.3	3.1	2.8	2.5	2.3	2.1	1.9	1.7
	250	13400	8.6	7.7	6.8	6.1	5.5	5.1	4.5	4.9	3.8	3.4	3.1	2.7	2.5
	280	16500	10.9	9.6	8.4	7.6	7.0	6.6	5.8	5.3	4.7	4.2	3.9	3.7	3.2
	315	25000	16.3	14.6	12.8	11.5	10.4	9.4	8.5	7.8	7.2	6.4	5.7	5.1	4.8
	355	37000	24.2	21.5	18.9	16.8	15.6	14.1	12.6	11.4	10.5	9.3	8.7	7.8	7.1
600	400	53000	33.5	30.0	27.9	24.0	22.5	20.1	18.1	16.3	14.4	12.7	11.9	11.0	9.7
	450	72000	45.0	40.4	36.0	32.3	29.3	26.5	24.4	22.4	20.0	17.7	16.6	15.0	13.5
	500	102000	65.5	58.7	51.4	46.2	41.8	38.8	34.3	31.0	29.0	25.7	23.4	21.3	19.4
	560	128000	80.8	72.7	64.2	60.1	53.7	50.2	44.4	40.0	37.5	33.2	29.6	27.7	24.4
	630	185000	119.8	107.4	94.2	84.3	76.3	69.1	61.1	56.2	52.6	46.6	42.0	38.8	35.1
	710	252000	164.0	145.6	128.5	114.5	106.2	98.9	89.3	80.6	73.4	64.9	59.3	53.0	45.9
	800	355000	227.7	204.3	190.3	163.6	152.9	136.6	123.1	110.9	97.7	86.5	81.0	74.8	65.9
	200	6300	4.1	3.9	3.6	3.3	3.0	2.9	2.7	2.4	2.3	1.9	1.8	1.6	1.4
	225	8800	7.1	6.3	5.5	5.0	4.6	4.2	3.8	3.5	3.2	2.8	2.6	2.4	2.1
	250	13400	10.7	9.6	8.4	7.6	6.9	6.4	5.7	5.0	4.7	4.2	3.9	3.4	3.2
	280	16500	13.6	12.0	10.6	9.5	8.8	8.2	7.3	6.6	5.9	5.2	4.9	4.6	4.0
	315	25000	20.3	18.2	16.0	14.4	13.0	11.8	10.6	9.7	9.0	8.0	7.1	6.4	6.0
	355	37000	30.2	26.8	23.7	21.0	19.5	17.6	15.7	14.2	13.1	11.6	10.9	9.7	8.9
750	400	53000	41.8	37.5	34.9	30.0	28.1	25.1	22.6	20.4	18.0	15.9	14.9	13.8	12.2
	450	72000	56.3	50.5	45.0	40.4	36.6	33.1	30.5	28.0	25.0	22.1	20.7	18.7	16.9
	500	102000	81.9	73.3	64.3	57.8	52.3	48.5	42.9	38.8	36.3	32.1	29.2	26.6	24.3
	560	128000	101.0	90.2	80.3	75.1	67.1	62.7	55.5	50.0	46.9	41.5	37.0	34.6	30.5
	630	185000	149.8	134.2	117.7	105.4	95.4	86.3	76.4	70.2	65.8	58.4	52.5	48.5	43.8
	710	252000	205.0	182.1	160.6	143.1	132.7	123.7	111.6	100.8	91.7	81.2	74.2	66.2	57.3
	800	355000	284.7	255.4	237.9	204.5	191.2	170.7	153.9	138.7	122.2	108.1	101.3	93.5	82.4

表11 (续)　Table 11 (finished)

输入轴转速 Input shaft rotating speed (r/min)	名义中心距 Nominal center distance a_n (mm)	输出转矩 Output torque (Nm)	公称传动比 Nominal transmission ratio											
			100.0	112.0	125.0	140.0	160.0	180.0	200.0	224.0	250.0	280.0	315.0	355.0	400.0
			公称输入功率 Nominal input power (kw)												
	200	6300	5.5	5.1	4.8	4.4	4.0	4.0	3.6	3.3	3.1	2.6	2.4	2.1	1.9
	225	8800	9.5	8.4	7.4	6.6	6.1	5.6	5.1	4.7	4.2	3.8	3.5	3.1	2.8
	250	13400	14.3	12.8	11.3	10.1	9.2	8.5	7.5	6.7	6.3	5.6	5.2	4.5	4.2
	280	16500	18.1	16.0	14.1	12.7	11.7	11.0	9.7	8.8	7.8	6.9	6.5	6.1	5.4
	315	25000	27.1	24.3	21.3	19.1	17.3	15.7	14.1	13.0	12.0	10.6	9.5	8.5	7.9
	355	37000	40.3	35.8	31.5	28.0	26.0	23.5	21.0	18.9	17.5	15.5	14.5	13.0	11.8
1000	400	53000	55.8	50.0	46.6	40.1	37.5	33.5	30.2	27.2	24.0	21.2	19.9	18.4	16.2
	450	72000	75.1	67.3	60.0	53.9	48.8	44.2	40.6	37.3	33.3	29.5	27.6	25.0	22.5
	500	102000	109.1	97.8	85.7	77.0	69.7	64.7	57.2	51.7	48.4	42.8	39.0	35.4	32.4
	560	128000	134.7	120.3	107.1	100.1	89.4	83.6	74.0	66.7	62.5	55.3	49.3	46.2	40.7
	630	185000	199.7	178.9	156.9	140.5	127.2	115.1	101.9	93.6	87.7	77.6	70.0	64.7	58.4
	710	252000	273.3	242.7	214.2	190.8	177.0	164.9	148.9	134.4	122.3	108.2	98.9	88.3	76.4
	800	355000	379.6	340.6	317.1	272.7	254.9	227.6	205.1	184.9	162.9	144.1	135.0	124.7	109.8
	200	6300	8.3	7.7	7.2	6.6	6.1	6.0	5.4	4.9	4.6	3.9	3.6	3.2	2.8
	225	8800	14.3	12.6	11.1	10.0	9.2	8.4	7.7	7.1	6.3	5.7	5.3	4.7	4.2
	250	13400	21.5	19.3	16.9	15.2	13.8	12.8	11.3	10.0	9.4	8.4	7.7	6.8	6.4
	280	16500	27.2	24.0	21.1	19.0	17.6	16.4	14.6	13.2	11.7	10.4	9.8	9.2	8.1
	315	25000	40.7	36.4	32.0	28.7	26.0	23.6	21.2	19.5	18.0	16.0	14.3	12.7	11.9
	355	37000	60.4	53.6	47.3	42.0	39.0	35.3	31.5	28.4	26.2	23.2	21.8	19.4	17.7
1500	400	53000	83.6	75.0	69.9	60.1	56.2	50.2	45.3	40.8	36.0	31.9	29.9	27.6	24.3
	450	72000	112.6	101.0	90.9	80.8	73.2	66.3	60.9	56.0	49.9	44.2	41.4	37.4	33.8
	500	102000	163.7	146.6	128.6	115.5	104.5	97.0	85.9	77.5	72.6	64.3	58.4	53.2	48.6
	560	128000	202.0	180.4	160.6	150.2	134.1	125.4	111.0	100.1	93.8	83.0	73.9	69.3	61.0
	630	185000	299.6	268.4	235.4	210.8	190.8	172.7	152.8	140.4	131.5	116.4	105.1	97.1	87.6
	710	252000	410.0	364.1	321.3	286.1	265.5	247.3	223.3	201.6	183.4	162.3	148.4	132.5	114.7
	800	355000	569.4	510.8	475.7	409.0	382.3	341.4	307.7	277.3	244.4	216.2	202.2	187.0	164.7

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减速器输出轴端的最大允许径向载荷R，作用于轴伸长度的中点位置，其值见表12。

R, the allowable maximum radial load of decelerator output shaft end, is applied on the central of shaft extension length, see table 12 for its value.

表12 Table 12

名义中心距 Nominal center distance a (mm)	160	180	200	225	250	280	315	355	400	450	500	560	630	710	800
最大允许径向载荷 R (KN) Allowed maximum radial load	10	15	25	32	40	48	52	60	90	120	150	170	200	240	270

减速器输出轴端的瞬时允许转矩为额定转矩的2.7倍。

The allowed instantaneous torque of decelerator output shaft end is 2.7 times of the rated torque.

10、选用方法

1) 确定减速器的公称传动比i_N

计算传动比$i_S=\frac{n_1}{n_2}$

式中：i_S——要求传动比；

n_1——原动机传速，r/min；

n_2——工作机转速，r/min。

根据要求的传动比选取接近的公称传动比i_N。

2) 确定减速器的公称输入功率P_N

减速器的计算功率：$P_S=P_2\times f_1\times f_2$

式中： P_2——起重机机构的功率，kw；

f_1——工作机系数，根据起重机机构的载荷状况和利用等级按表13选取，（如果对起重机的工作级别不了解，可参考《起重机设计规范》〈GB/T3811〉附录N）；

f_2——原动机系数，对电动机和液压马达取$f_2=1$。

根据n_1、i_N和P_S查表11选取减速器的型号，使$P_N\geqslant P_S$

3) 校核减速器的最大转矩

$$P_N\geqslant\frac{M_n\times n_1\times f_3}{9550}$$

式中： M_n——电动机的额定转矩， N·m

f_3——峰值转矩系数，根据机构的载荷状况和利用等级由表13选取。

如果P_N未通过则要增大一机座号再验算，直至通过为止。

例：一台起重量为32t，跨度22.5m连续装卸用的抓斗桥式起重机，其起升机构所需静功率为50kw，起升速度为8m/min，卷筒转速为18.5r/min，机构工作级别为M7，起升电动机的额定功率为60kw，转速750r/min。试选择减速器（底座式，第Ⅲ种装配型式，齿轮轴端）。

1) 计算传动比

$$i_s=\frac{n_1}{n_2}=\frac{750}{18.5}=40.5$$

选$i_N=40$，三级传动

2) 确定减速器公称输入功率

$$P_S\geqslant P_2\times f_1\times f_2$$

根据连续装卸用抓斗桥式起重机，工作级别为M7，查GB/T3811附录N可知，主起升机构载荷状况为L3，利用等级为T6，查表13，$f_1=1.2$；减速器的计算功率

$$P_S=50\times 1.2\times 1=60kw$$

当$n_1=750r/min$，$i_N=40$，查表10，$a_1=355mm$，减速器公称输入功率$P_N=74.9kw$，满足要求。

3) 校核减速器的最大转矩

电动机的额定转矩

$$M_n=9550\times\frac{P_1}{n_2}=9550\times\frac{60}{750}=764Nm$$

由L3–T6–M7查表13，$f_3=1.0$

$$P_N=\frac{M_n\times n_1\times f_3}{9550}=\frac{764\times 750\times 1}{9550}=60kw$$

减速器公称输入功率$P_N=74.9kw>60kw$，满足要求。

最后选定减速器为QY3D355–40ⅢC

Selection method

1) Determine i_N, the nominal transmission ratio of decelerator

Calculate transmission ratio $i_S=\frac{n_1}{n_2}$

In which:

i_S——required transmission ratio

n_1——rotating speed of prime mover, r/min

n_2——rotating speed of working machine, r/min

Select the approximate nominal transmission ratio i_N, according to the required transmission ratio.

2) Determine nominal input power of decelerator, P_N

Calculate decelerator horsepower: $P_S=P_2\times f_1\times f_2$

In which:

P_2——horsepower of hoist mechanism, kw

f_1——working machine factor, selected in table 13 according to the loading status and using grade of hoist mechanism (if you don't know working grade of the hoist, refer to Hoist Designing Criteria (GB/T3811) appendix N)

f_2——prime mover factor, f_2=1 is selected for motor and hydraulic motor.

Use table 11 to select decelerator model according to n_1, i_N and P_S, and allow $P_N\geqslant P_S$

3) Check for maximum torque of decelerator

$$P_N\geqslant\frac{M_n\times n_1\times f_3}{9550}$$

In which:

M_n——rated torque of motor, N·m

f_3——peak torque factor, selected in table 13 according to the loading status and using grade of the hoist mechanism.

If P_N is not qualified, machine support number should be added by one before calculation until it is qualified.

Example: a grab bucket bridge type hoist, with the weight of 32t, the span of 22.5m, for continuous operation. The net power required by its hoisting mechanism is 50kw, hoisting speed is 8m/min, rotating speed of the roller is 18.5r/min, working grade of the mechanism is M7, rated horsepower of the hoisting motor is 60kw, and the rotating speed is 750r/min. Select proper decelerator (pedestal mode, type Ⅲ assembly form, gear wheel shaft end).

1) Calculate transmission ratio

$$i_s=\frac{n_1}{n_2}=\frac{750}{18.5}=40.5$$

Select i_N=40, 3-step transmission

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2) Determine nominal input power of the decelerator

$$P_S\geqslant P_2\times f_1\times f_2$$

According to the continuous loading and unloading grab bucket bridge type hoist with the working grade of M7, check GB/T3811 appendix N and find out the loading status of main hoisting mechanism is L3, using grade is T6, check table 13, and find f_1=1.2; Decelerator calculated power is

$$P_S=50\times 1.2\times 1=60kw$$

When n_1=750r/min, i_N=40, use table 10, and find a_1=355mm. Nominal input power of decelerator is P_N=74.9kw, and it can meet the requirement.

3) Check maximum torque of the decelerator

The rated torque of motor is

$$M_n=9550\times\frac{P_1}{n_1}=9550\times\frac{60}{750}=764Nm$$

According to L3-T6-M7, use table 13, and find f_3=1.0

$$P_N=\frac{M_n\times n_1\times f_3}{9550}=\frac{764\times 750\times 1}{9550}=60kw$$

Nominal input power of decelerator is P_N=74.9kw > 60kw, so it can meet the requirement.

The final selection of decelerator is QY3D355-40 ⅢC.

表13 工作机系数f_1，尖峰转矩系数f_3 Table 13 Woking machine factor f_1, peak torque factor f_3

载荷状况 Load status		立方根均值 4)	系数	利用系数 Using grade											
载荷状态 Load condition	说明 Instruction	Cube root average value 4)	Factor	T_0	T_1		T_2		T_3		T_4		T_5		T_6
				总的使用时间(小时) Total using hours (hr)											
				≤200	>200 ~400		>400 ~800		>800 ~1600		>1600 ~3200		>3200 ~6300		>6300 ~12500
轻 L1	很少额定载荷，一般轻微载荷	K≤ 0.05	1) f1	0.8	0.8		0.8		0.8		0.8		0.9		1.0
Light L1	Very low rated load, general light load		2) f3	0.8	0.8	M1	0.8	M1	0.8	M2	0.8	M3	0.8	M4	0.9	M5
			3) f3	1.2	1.2		1.3		1.3		1.3		1.3		1.4
中 L2	有时额定载荷经常作用轻微载荷	0.05< K≤ 0.63	1) f1	0.8	0.8		0.8		0.9		0.9		1.0		1.1
Medium L2	Sometimes rated load Regularly applied light load		2) f3	0.8	0.8	M1	0.8	M2	0.9	M3	0.8	M4	0.8	M5	0.9	M6
			3) f3	1.2	1.2		1.3		1.3		1.3		1.3		1.4
重 L3	经常作用额定载荷一般作用中等载荷	0.63< K≤ 0.80	1) f1	0.8	0.8		0.9		1.0		1.0		1.1		1.2
Heavy L3	Regularly applied rated load Generally applied medium load		2) f3	0.8	0.8	M1	0.8	M2	0.8	M3	0.8	M4	0.9	M5	1.0	M6
			3) f3	1.2	1.2		1.3		1.3		1.3		1.4		1.5
特重 L4	频繁作用额定载荷	0.80< K≤ 1.00	1) f1	0.8	0.8		0.9		1.0		1.0		1.1		1.2
Extra heavy L4	Frequently applied rated load		2) f3	0.8	0.8	M2	0.8	M3	0.8	M4	0.8	M5	0.8	M6	0.9	M7
			3) f3	1.2	1.2		1.3		1.3		1.3		1.4		1.5

载荷状况 Load status		立方根均值 4)	系数	利用系数 Using grade											
载荷状态 Load condition	说明 Instruction	Cube root average value 4)	Factor	T_7		T_8		T_9							
				总的使用时间(小时) Total using hours (hr)											
				>6300 ~12500	>12500 ~25000		>25000 ~50000		>50000						
轻 L1	很少额定载荷，一般轻微载荷	K≤ 0.05	1) f1	1.0	1.0		1.1		1.2						
Light L1	Very low rated load, general light load		2) f3	1.4	1.5	M6	1.6	M7	1.8	M8					
			3) f3	1.1	1.2		1.3		1.4						
中 L2	有时额定载荷经常作用轻微载荷	0.05< K≤ 0.63	1) f1	0.9	1.0	M6	1.1	M7	1.3	M8					
Medium L2	Sometimes rated load Regularly applied light load		2) f3	1.4	1.5		1.6		1.8						
			3) f3	1.2	1.3		1.4		1.6						
重 L3	经常作用额定载荷一般作用中等载荷	0.63< K≤ 0.80	1) f1	1.2	1.3		1.4		1.6						
Heavy L3	Regularly applied rated load Generally applied medium load		2) f3	1.5	1.6	M7	1.8	M8	2	M9					
			3) f3	1.2	1.3		1.4		1.6						
特重 L4	频繁作用额定载荷	0.80< K≤ 1.00	1) f1	1.3	1.4	M8	1.6	M9	1.8	M10					
Extra heavy L4	Frequently applied rated load		2) f3	1.6	1.8		2		2						
			3) f3	1.5	1.6		1.8		2						

1) f1——工作机系数。
2) f3——尖峰转矩系数在恒定载荷下，起重机的起升和变幅机构。
3) f3——尖峰转矩系数在交变载荷作用下，起重机的回转和运行机构。
4) K——立方根均值，详见《起重机设计规范》机构载荷谱。

1) f1——working machine factor
2) f3——the hoisting and amplitude mechanism of the hoist when peak torque factor is under constant load
3) f3——the revolving and running mechanism of the hoist when peak torque factor is under alternating load
4) K——cube root, see Hoist Designing Criteria for machanism load spectrum

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二、QJY型起重机用硬齿面减速器

Type QJY decelerator used for hoist

1、产品分类 Product classification

QJY系列减速器是工厂根据国内外市场要求开发的硬齿面（渗碳，淬火齿面）起重机减速器，包括三大类12种基本型式。其结构见图12，其型式代号与主要参数见表14。

QJY series decelerator is a hard tooth face (carbonized, quenched tooth face) hoist-used decelerator developed to meet the requirements of the market both at home and abroad, including 3 major classifications and 12 basic forms. See figure 12 for its structural diagram, and table 14 for its form code and main parameters.

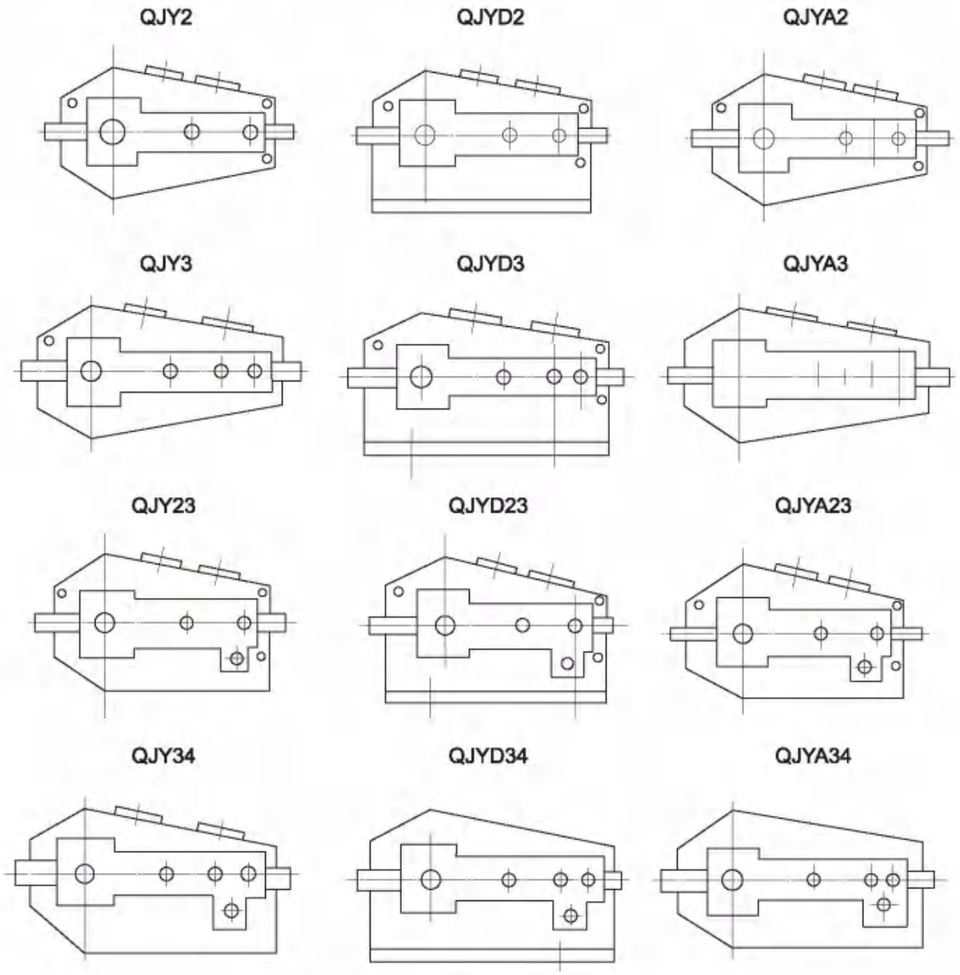

图12 QJY减速器简图

Figure 12 Type QJY decelerator diagram

表14 QJY系列减速器型式代号与主要参数

Table 14 QJY series decelerator model denotation and main qarameters

代号 Denotation				级数 Number of stages	传动比范围 Range of transmission ratio	许用功率范围 Range of allowed power	名义中心距离范围 Range of nominal center distance
基本型 Basic type	紧凑型 Compact type	地脚安装型 Anchor bolt installation type	空心轴型 Hollow shaft type				
QJY2		QJYD2	QJYA2	2	6.3-20	8.7-5717	140-800
QJY3	QJY23	QJYD3 QJYD23	QJYA23 QJYA3	3	20-100	2.9-1801	170-800
	QJY34	QJYD34	QJYA34	4	100-400	0.72-360	170-800

2、性能特点： Performance and properties:

(1)齿轮均采用优质低碳合金钢，渗碳，淬火，齿轮精度6级。

(2)精度高，效率高，传动平稳，噪音低，比调质齿轮减速器（QJ系列）体积小、重量轻、承载能力大、可靠性高。

(3)焊接箱体结构。安装形式：三支点安装和地脚安装。

(4)轮出轴型式；平键，渐开线花键，齿轮轴端，空心轴四种。

(5)一般采用油池润滑，自然冷却，立式减速器采用循环油润滑。

(6)采用滚动轴承。

(1)All gears are made of quality low-carbon alloy steel and treated with cementite and quenching, gear precision up to Class 6.

(2)High precision, high efficiency, stable driving, low noise, smaller than hardening and tempering gears (QJ series), light weight, high carrying capacity, high reliability.

(3)Welded cabinet structure. Installation method: 3-supporting-point and anchor bolt.

(4)Output shaft type: 4 type of flat key, involute spline, gear shaft end and hollow shaft

(5)Oil sump lubrication is normally used, natural cooling, circulating oil lubrication is used for vertical decelerator.

(6)Rolling bearing is used.

应用范围： Application:

1、输入转速一般$n_1 \leqslant 1500$r/min。

2、工作环境温度-40~+50℃。

3、正反两向运转。

适合各种类型起重机减速器选用。

1、Input rotating speed is usually $n_1 \leqslant 1500$r/min.

2、Working ambient temperature is -40~+50℃.

3、Both forward and backword operation are available.

Suitable for various type of decelerators for hoist

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3、装配型式（见图13）： Installation method (see Figure 13)

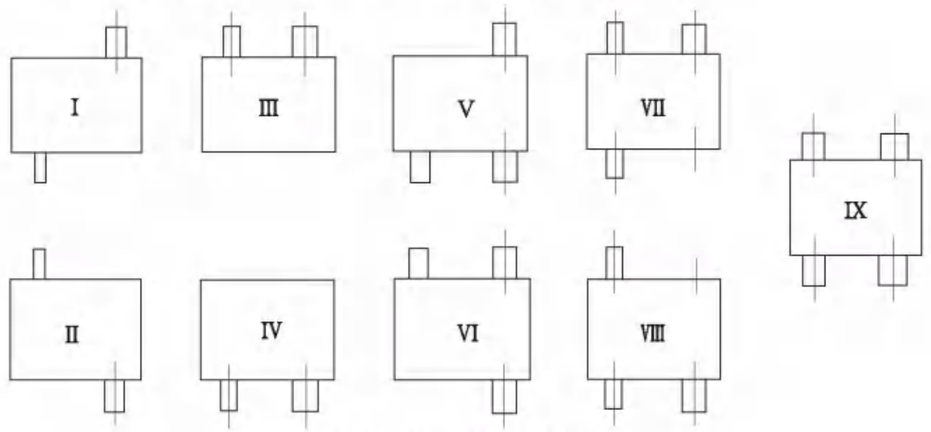


图13 减速器装配型式

Figure 13 Decelerator installation method

4、安装型式： Installation method

QJYD2、QJYD3、QJYD23、QJYD34型采用地脚安装。

QJY2、QJY3、QJY23、QJY34型式采用三支点支承安装。（安装方式见图15）

允许有卧式W或立式L两种方式。（见图14）

Anchor bolt installation is used for type QJYD2, QJYD3, QJYD23, QJYD34.

3-supporting-point for carrying installation method is used for type QJY2, QJY3, QJY23 and QJY34. (See figure 15 for installation method).

Horizontal W and vertical L are avaliable. (See figure 14)

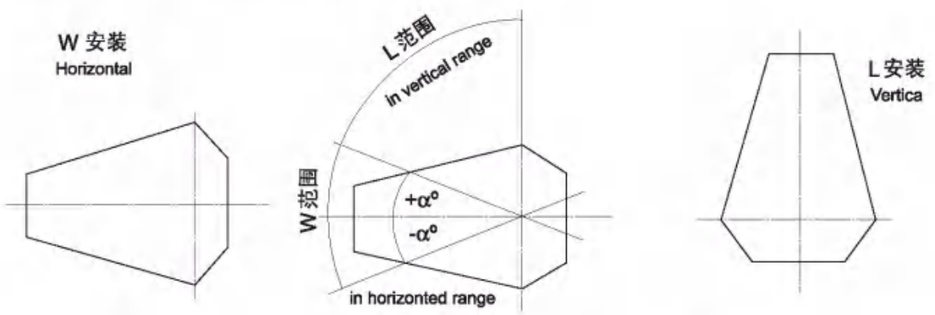


图14 QJY2, QJY3, QJY23, QJY34, QJYA2, QJYA3, QJYA23, QJYA34 安装型式

Figure 14 Installation method for type QJY2, QJY3, QJY23, QJY34,QJYA2, QJYA3, QJYA23, QJYA34

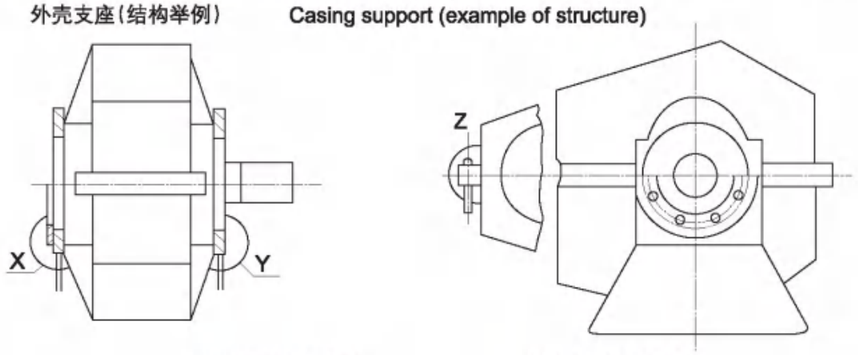
注：α° 角的度数与传动比有关，当减速倾斜α角时，应保证使中间级大齿轮浸油1~2个齿高深度（α° 具体数据由用户自定）

Note: The value of angle & relates to transmission ratio. When there is a reducing slope of α, the middle-stage big gear should infuse 1-2 tooth depth of lubricating oil. (value of α is determined by user)

QJY2、QJY3、QJY23、QJY34型减速器支承型式见图15

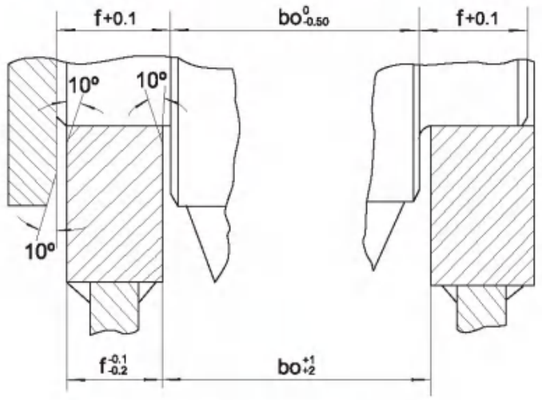
See Figure 15 for the supporting method of type QJY2, QJY3, QJY23 QJY34 decelerators

外壳支座(结构举例)　Casing support (example of structure)



X放大(固定支座)
Enlarge X (Fixed seat)

Y放大(浮动支座)
Enlarge Y (Floating seat)



Z放大　Enlarge Z

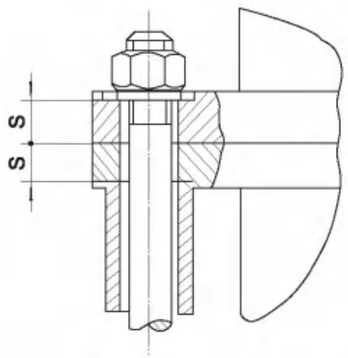


图15 QJY2、QJY3、QJY23、QJY34支承型式

Figure 15 Supporting method of type QJY2, QJY3, QJY23, QJY34

5、轴端型式 Shaft end mode

高速轴端采用圆柱轴伸平键联接。

输出轴端　P——圆柱轴伸平键，单键联接；

H——圆柱轴伸渐开线花键联接；

C——齿轮轴端（仅用于中心距为170–560mm的减速器）。

轴端结构型式和尺寸参数见图16和表15

Cylinder shaft extension flat key connection is used for high-speed shaft end.

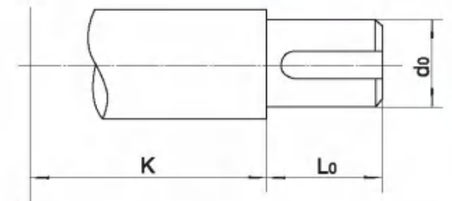
Output shaft end:　P——cylinder shaft extension flat key, single key connection

H——cylinder shaft extension involute spline connection

C——gear wheel shaft end (only for the decelerator with center distance of 236–560mm)

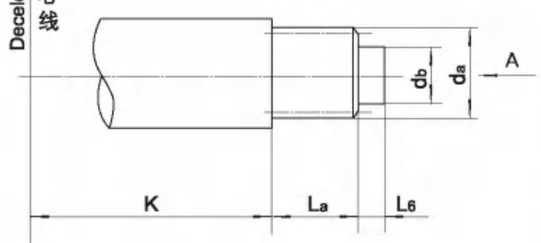
See Figure 16 and Table 15 for shaft end structure mode and dimension

P型圆柱形轴端
Type P cylinder shaft end



Decelerator centerline 减速器中心线

H型花键轴端
Type H spline shaft end



C型齿轮轴端
Type C gear wheel shaft end

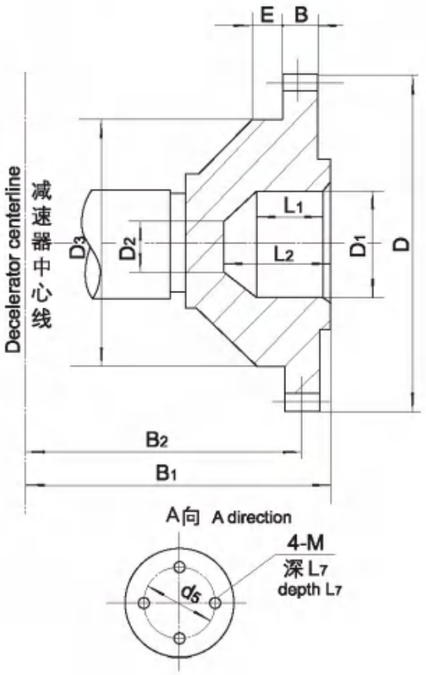


图16 输出轴端型式

Figure 16 Output shaft end mode

表15 输出轴端尺寸参数表 Table 15 Output shaft end dimension parameters

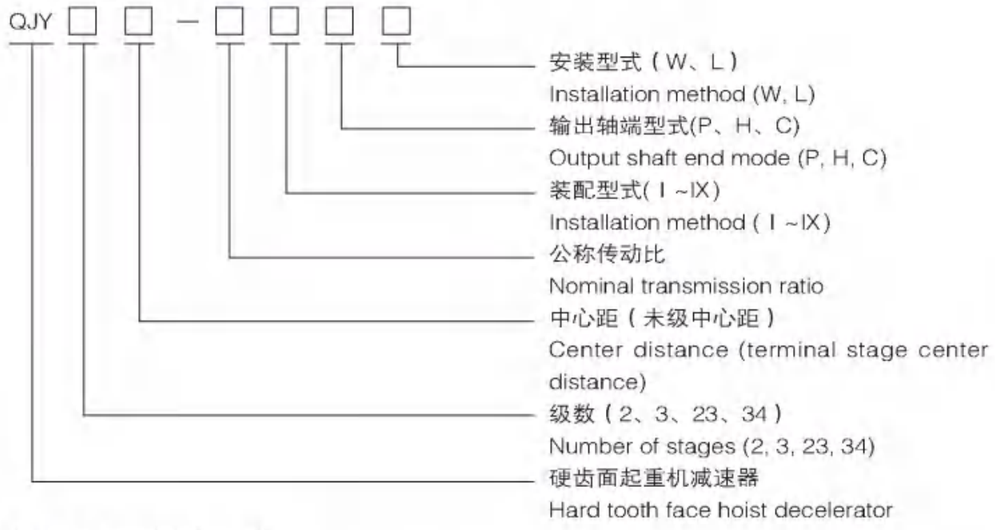
名义中心距 Nominal center distance	K	P型 Type P		C型 Type C											H型 Type H							
		d_0 (r_8)	L_0	mXz	D	D_1 (H_7)	D_2	D_3	B_1	B_2	B	E	L_1	L_2	mXz	d_a (h_{11})	L_a	d_5	M	d_b (k_6)	L_6	L_7
140	155	65	105												3X20	65	35	40	8	60	30	16
170	165	75	140	3X56	174	90	40	135	279.5	253	25	25	45	60	3X24	75	40	50	8	70	35	16
200	195	95	170	4X56	232	120	40	170	339.5	308	35	25	50	75	5X18	95	50	60	8	80	40	16
236	225	110	210	4X56	232	120	40	170	339.5	308	35	25	50	75	5X21	110	55	70	10	100	45	20
280	250	130	200	6X56	348	170	45	260	402	370	40	32	76	100	5X25	130	70	90	10	120	50	20
335	280	140	250	6X56	348	170	45	260	429	397	40	32	76	100	5X27	140	75	100	12	140	55	25
370	310	170	300	7X56	406	180	50	260	450	419	50	32	76	100	5X33	170	75	100	12	140	55	25
400	340	180	300	8X54	448	200	105	260	482	442	50	32	78	100	5X35	180	85	120	12	160	60	25
450	375	210	350	10X48	500	200	105	280	570	505	60	35	78	100	5X41	210	95	140	12	180	60	25
500	410	240	410	10X58	600	250	110	320	650	575	70	40	80	105	8X29	240	105	160	12	190	65	25
560	460	260	410	10X58	600	250	110	320	650	575	70	40	80	105	8X31	256	120	180	16	220	65	32
630	495	300	470												8X36	296	135	200	16	250	65	32
710	565	320	550												8X39	320	150	220	20	280	75	40
800	645	360	550												8X44	360	170	250	20	320	80	40

*键槽按GB1095-79 *Keyway is in accordance with GB1095-79

6、代号示例 Example of denotation

三支点支承起重机减速器；

3-supporting-point carrying hoist decelerator



标记示例：Example of notation:

起重机减速器三级传动，名义中心距a_1=500mm，公称传动比50，装配型式第Ⅲ种，输出轴端为齿轮轴端，卧式安装则标记为：QJY3500-50ⅢCW。

Hoist decelerator with 3-stage transmission, nominal center distance is a_1=500mm, nominal transmission ratio is 50, installation method is Ⅲ, output shaft end is gear shaft end, and horizontal installation is used, so the denotation is QJY3500-50ⅢCW.

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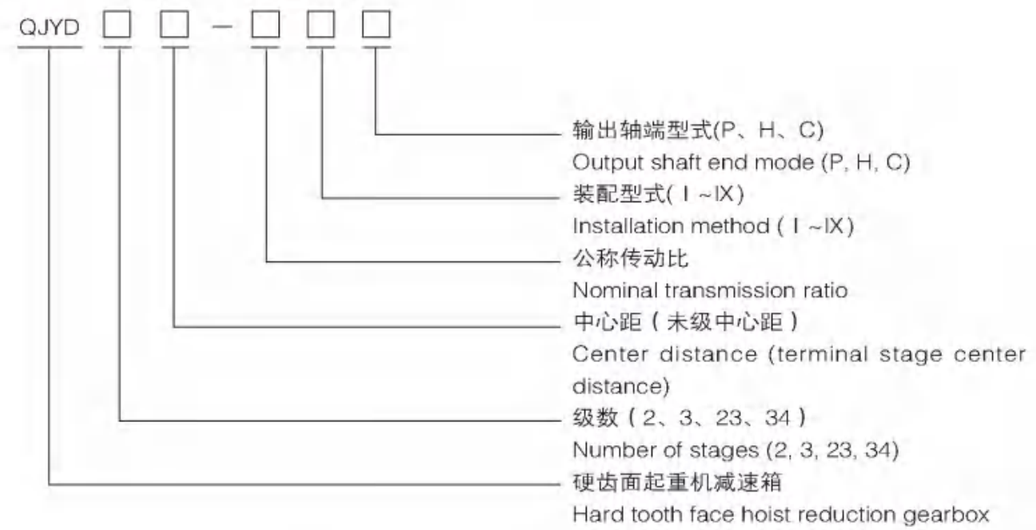
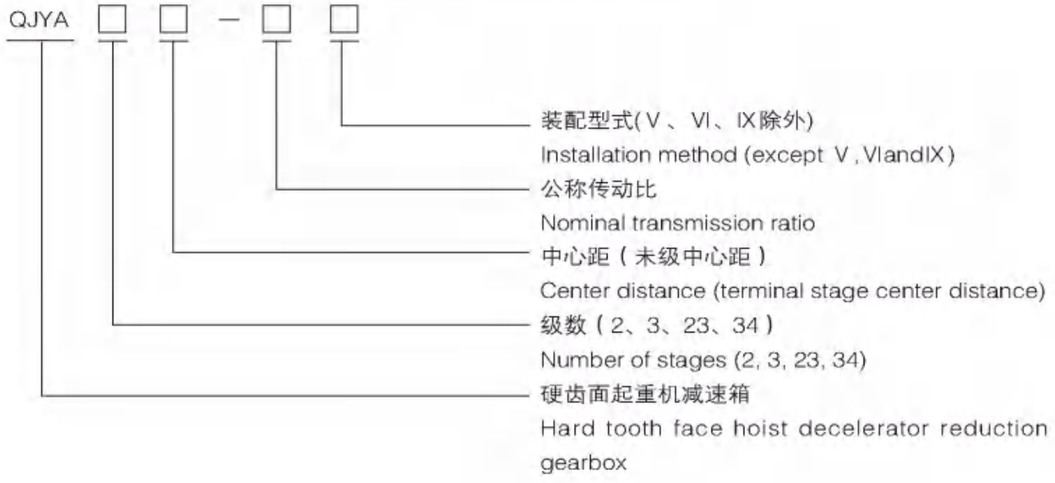
带底座起重机减速器 Hoist decelerator with base frame



起重机减速器二级传动，名义中心距a_1=500mm，公称传动比i=20，第Ⅳ种装配型式，轴端型式为P型的标记为：QJYD2500-20ⅣP。

Hoist decelerator with 2-stage transmission, nominal center distance is a_1=500mm, nominal transmission ratio is i=20, installation method is Ⅳ, shaft end type is P, so the denotation is QJYD2500-20ⅣP.

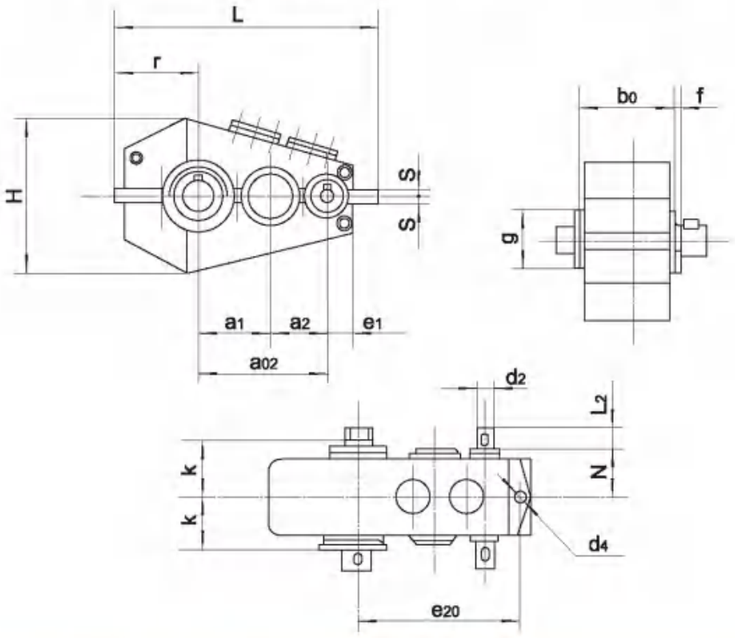
带空心轴起重机减速器 Hoist decelerator with hollow shaft



7、外形、安装尺寸 External and installation dimension

1) 表16 QJY2、QJYA2减速器外形及安装尺寸 (mm)

Table 16: External and installation dimension for type QJY2, QJYA2 decelerator (mm)



名义中心距 a_1 Nominal center distance	a_2	a_{02}	i=6.3～11.2		i=12.5～20		L	H	K	b_0 -0.5	f +0.1	g h9	d_4	e_{20}	S	r	e_1	N	重量 Weight (kg)
			d_{2r6}	L_2	d_{2r6}	L_2													
140	100	240	32	58	28	60	555	320	155	240	18	180	18	355	17	170	85	135	80
170	118	288	42	58	32	58	655	410	165	255	18	220	22	420	22	202	106	140	115
200	140	340	48	82	38	58	758	455	195	275	20	250	26	495	27	232	117.5	180	210
236	170	406	60	105	48	82	890	518	225	320	20	270	26	590	27	272	142	210	330
280	200	480	65	105	55	90	1035	584	250	370	25	320	33	685	32	314	155	235	520
			i=6.3～12.5		i=14～20														
			d_{2r6}	L_2	d_{2r6}	L_2													
335	236	571	80	130	65	105	1225	735	280	420	25	350	39	810	37	375	180	260	780
370	260	630	85	140	70	105	1350	804	310	480	25	400	39	895	37	410	190	280	950
400	280	680	90	170	80	130	1470	867	340	530	30	400	45	975	37	447	215	310	1350
450	320	770	100	180	85	130	1645	990	375	580	30	480	45	1090	42	506	240	350	1760
500	360	860	110	180	95	170	1805	1130	410	650	40	530	52	1200	42	554	260	370	2500
560	400	960	120	210	110	180	1995	1270	460	700	40	580	52	1315	47	626	265	390	3450
630	450	1080	140	250	120	210	2236	1380	495	770	40	600	62	1470	47	704	295	440	4800
710	500	1210	160	300	140	250	2518	1540	565	875	50	650	62	1660	55	781	335	520	6800
800	560	1360	180	300	160	300	2834	1780	645	1020	60	770	70	1870	55	880	375	575	9400

*键槽按GB1095-79

** QJYA2空心轴有关尺寸见表24

* Keyway in accordance with GB1095-79

** Hollow shaft dimensions see talbe 24

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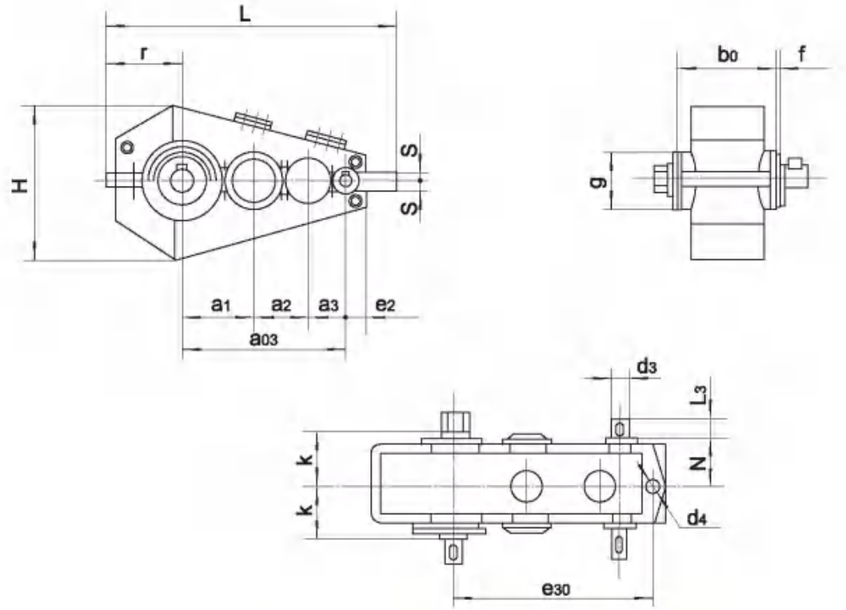
2) 表17 QJY3、QJYA3减速器外形及安装尺寸 (mm)

Table 17: External and installation dimension for type QJY3, QJYA3 decelerator (mm)



名义中心距 a_1 Nominal center distance	a_2	a_3	i=22.4～71		i=80～100		L	H	N	K	b_0 -0.5	f +0.1	g h9	d_4	e_{30}	S	r	e_2	重量 Weight (kg)
			d_{3r6}	L_3	d_{3r6}	L_3													
170	118	85	25	42	20	36	730	410	140	165	255	18	220	22	495	22	202	85	150
200	140	100	32	58	22	36	832	455	180	195	275	20	250	26	570	27	232	95	230
236	170	118	38	58	28	60	976	518	210	225	320	20	270	26	675	27	272	115	370
280	200	140	48	82	38	80	1164	584	235	250	370	25	320	33	790	32	314	120	600
			i=20～56		i=63～100														
			d_{3r6}	L_3	d_{3r6}	L_3													
335	236	170	55	82	42	82	1360	735	260	280	420	25	350	39	945	37	375	142	870
370	260	185	60	105	48	82	1495	804	280	310	480	25	400	39	1030	37	410	150	1080
400	280	200	65	105	55	90	1602	867	310	340	530	30	400	45	1100	37	447	155	1500
450	320	225	70	105	60	105	1801	990	350	375	580	30	480	45	1240	42	506	175	1950
500	360	250	80	130	65	105	1990	1130	370	410	650	40	530	52	1380	42	554	200	2750
560	400	280	95	170	75	120	2260	1270	390	460	700	40	580	52	1575	47	626	235	3850
630	450	320	110	180	85	130	2540	1380	440	495	770	40	600	62	1775	47	704	255	5400
710	500	360	120	210	90	170	2840	1540	520	565	875	50	650	62	1995	55	781	295	7400
800	560	400	140	250	100	180	3190	1780	575	645	1020	60	770	70	2230	55	880	335	10300

*键槽按GB1095-79

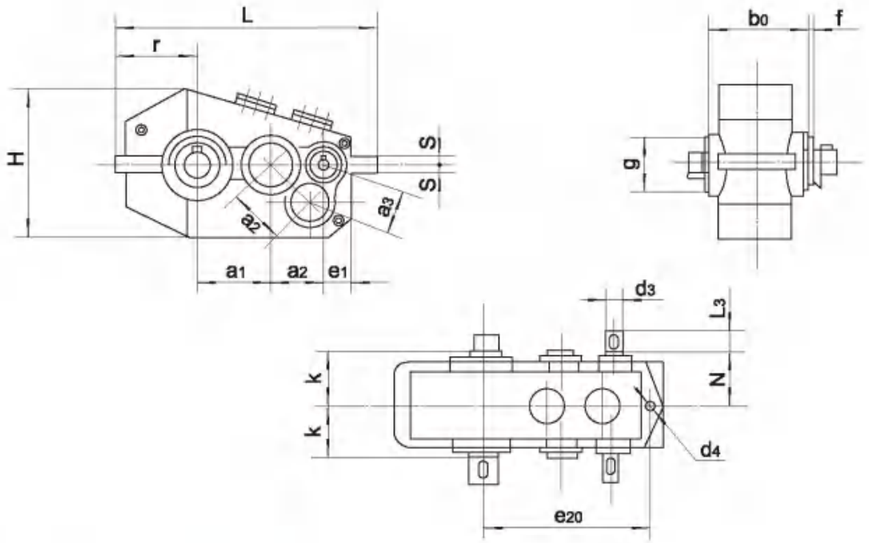
** QJYA3空心轴有关尺寸见表24

* Keyway in accordance with GB1095-79

** Hollow shaft dimensions see talbe 24

3) 表18　QJY23、QJYA23减速器外形及安装尺寸 (mm)

Table 18: External and installation dimension for type QJY23, QJYA23 decelerator (mm)



名义中心距 a_1 Nominal center distance	a_2	a_3	i=22.4～71 d_{3r6}	i=22.4～71 L_3	i=80～100 d_{3r6}	i=80～100 L_3	L	H	N	K	b_0 -0.5	f +0.1	g h9	d_4	S	e_{20}	r	e_1	重量 Weight (kg)
170	118	85	25	42	20	36	655	420	140	165	255	18	220	22	22	420	202	95	150
200	140	100	32	58	22	36	758	446	180	195	275	20	250	26	27	495	232	195	240
236	170	118	38	58	28	60	890	500	210	225	320	20	270	26	27	590	272	125	370
280	200	140	48	82	38	80	1035	562	235	250	370	25	320	33	32	685	314	145	580
			i=20～56		i=63～100														
			d_{3r6}	L_3	d_{3r6}	L_3													
335	236	170	55	82	42	82	1225	710	260	280	420	25	350	39	37	810	375	180	880
370	260	185	60	105	48	82	1350	770	280	310	480	25	400	39	37	895	410	190	1100
400	280	200	65	105	55	90	1470	836	310	340	530	30	400	45	37	975	447	215	1550
450	320	225	70	105	60	105	1645	980	350	375	580	30	480	45	42	1090	506	240	2050
500	360	250	80	130	65	105	1805	1060	370	410	650	40	530	52	42	1200	554	260	2800
560	400	280	95	170	75	120	1995	1240	390	460	700	40	580	52	47	1315	626	265	3900
630	450	320	110	180	85	130	2236	1370	440	495	770	40	600	62	47	1470	704	295	5550
710	500	360	120	210	90	170	2518	1530	520	565	875	50	650	62	55	1660	781	335	7700
800	560	400	140	250	100	180	2834	1760	575	645	1020	60	770	70	55	1870	880	375	10400

*键槽按GB1095-79

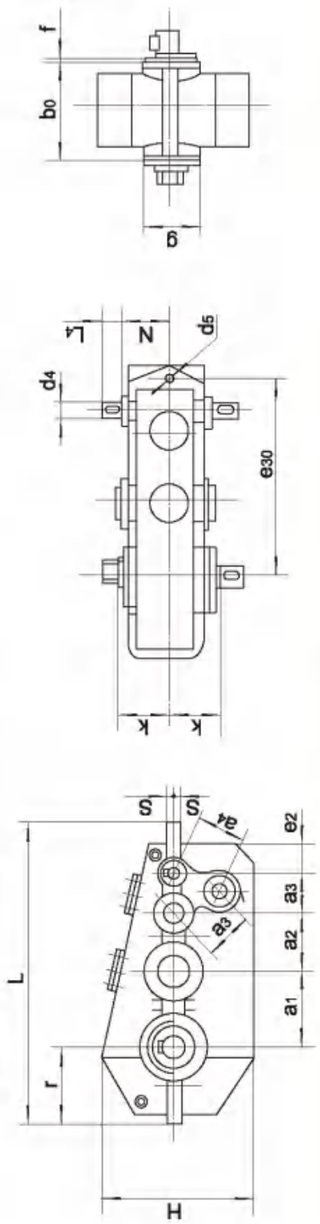
** QJYA23空心轴有关尺寸见表24

* Keyway in accordance with GB1095-79

** Hollow shaft dimensions see talbe 24

4) 表19　QJY34、QJYA34减速器外形及安装尺寸 (mm)

Table 19: External and installation dimension for type QJY34, QJYA34 decelerator (mm)



名义中心距 a_1 Nominal center distance	a_2	a_3	a_4	a	i=100～140 d_{4r6}	i=100～140 L_4	i=160～280 d_{4r6}	i=160～280 L_4	i=315～400 d_{4r6}	i=315～400 L_4	L	H	N	K	b_0 -0.5	f +0.1	g h_9	d_4	e_{30}	S	r	e_2	重量 Weight (kg)
170	118	85	63	436	20	35	20	35	16	30	730	420	140	165	255	18	220	22	485	22	202	85	175
200	140	100	70	510	22	35	22	35	20	35	832	440	180	195	275	20	250	26	570	27	232	95	270
236	170	118	90	614	25	40	25	40	22	35	976	500	210	225	320	20	270	26	665	27	272	103	400
280	200	140	100	720	28	50	28	50	25	40	1164	562	235	250	370	25	320	33	790	32	314	115	620
335	236	170	118	859	35	60	35	60	28	50	1360	710	260	280	420	25	350	39	935	37	375	135	900
370	260	185	130	945	38	70	38	70	35	60	1495	770	280	310	480	25	400	39	1030	37	410	150	1130
400	280	200	140	1020	42	70	42	70	35	60	1602	836	310	340	530	30	400	45	1100	37	447	155	1570
450	320	225	160	1153	48	80	42	70	38	70	1801	980	350	375	580	30	480	45	1230	42	506	175	2030
					i=100～180		i=200～250		i=280～400														
					d_{4r6}	L_4	d_{4r6}	L_4	d_{4r6}	L_4													
500	360	250	180	1290	48	80	42	70	38	70	1990	1060	370	410	650	40	530	52	1370	42	554	190	2850
560	400	280	200	1440	60	105	55	90	48	80	2260	1240	390	460	700	40	580	52	1550	47	626	225	3950
630	450	320	225	1625	65	105	60	105	48	80	2540	1370	440	495	770	40	600	62	1750	47	704	240	5500
710	500	360	250	1820	75	120	65	105	55	90	2840	1530	520	565	875	50	650	62	1950	55	781	260	7600
800	560	400	280	2040	80	140	70	120	65	105	3190	1760	575	645	1020	60	770	70	2200	55	880	280	10500

*键槽按GB1095-79

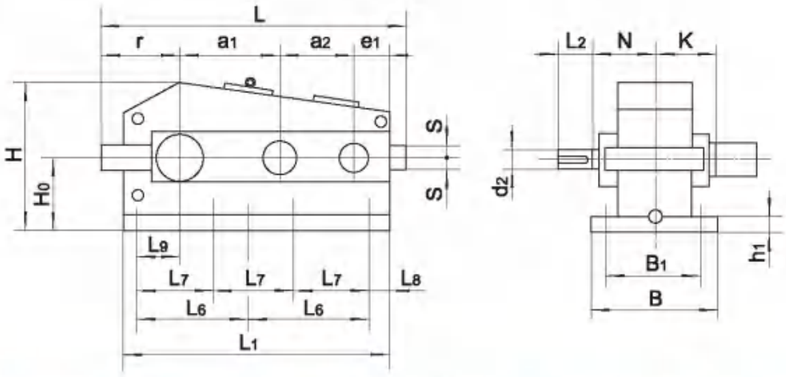
** QJYA34空心轴有关尺寸见表24

* Keyway in accordance with GB1095-79

** Hollow shaft dimensions see talbe 24

5) 表20　QJYD2减速器外形及安装尺寸 (mm)

Table 20: External and installation dimension for type QJYD2 decelerator (mm)



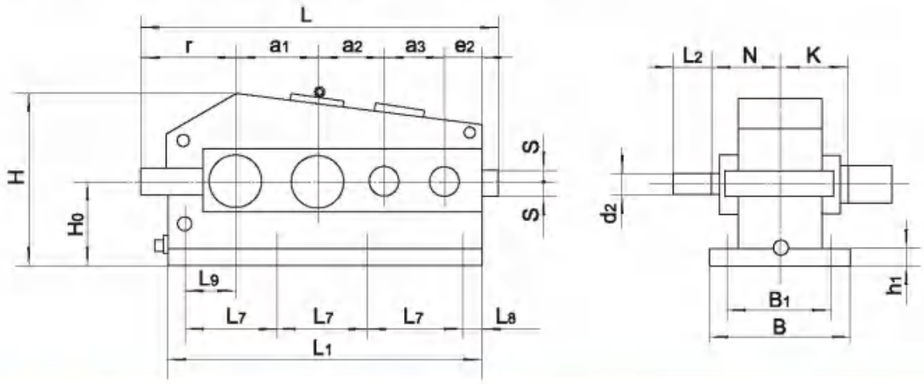
名义中心距 a_1 Nominal center distance	a_2	a_{02}	i=6.3～11.2		i=12.5～20		L	H	K	S	r	e_1	N	H_0	L_1	B	h_1	B_1	L_6	L_7	L_8	L_9	d	重量 Weight (kg)
			d_{2r6}	L_2	d_{2r6}	L_2																		
140	100	240	32	58	28	60	515	320	155	17	170	85	135	160	475	245	25	210	200	-	37.5	112.5	M12	100
170	118	288	42	58	32	58	655	410	165	22	202	124	140	205	580	300	32	250	245	-	45	120	M16	141
200	140	340	48	82	38	58	714	452.5	195	27	232	117.5	180	225	665	355	40	300	280	-	52.5	155	M20	260
236	170	406	60	105	48	82	890	509	225	27	272	182	210	250	830	405	40	350	350	-	65	177	M20	406
280	200	480	65	105	55	90	978	607	250	32	314	155	235	315	920	500	50	430	380	-	80	205	M24	640
			i=6.3～12.5		i=14～20																			
			d_{2r4}	L_2	d_{2r6}	L_2																		
335	236	571	80	130	65	105	1225	722.5	280	37	375	211.5	260	355	1090	570	63	500	450	-	95	212.5	M30	959
370	260	630	85	140	70	105	1350	802	310	37	410	228.5	280	400	1187	620	63	520	493.5	-	100	228.5	M30	1169
400	280	680	90	170	80	130	1404	933.5	340	37	447	215	310	450	1280	690	80	590	520	-	120	265	M36	1645
450	320	770	100	180	85	130	1582	995	375	42	506	240	350	500	1450	750	80	650	-	400	125	315	M36	2328
500	360	860	110	180	95	170	1748	1125	410	42	554	260	370	560	1600	830	100	710	-	440	140	340	M42	3230
560	400	960	120	210	110	180	1942	1265	460	47	626	265	390	630	1760	910	100	790	-	490	145	390	M42	4370
630	450	1080	140	250	120	210	2178	1400	495	47	704	295	440	710	1980	1010	125	870	-	540	180	425	M48	6080
710	500	1210	160	300	140	250	2432	1570	565	55	781	335	520	800	2220	1110	125	950	-	610	195	480	M48	8360
800	560	1360	180	300	160	300	2730	1790	645	55	880	375	575	900	2500	1320	160	1140	-	680	230	535	M56	11875

*键槽按GB1095-79　　* Keyway in accordance with GB1095-79

** 空心轴有关尺寸见表24　　** Hollow shaft dimensions see talbe 24

6) 表21　QJYD3减速器外形及安装尺寸 (mm)

Table 21: External and installation dimension for type QJYD3 decelerator (mm)



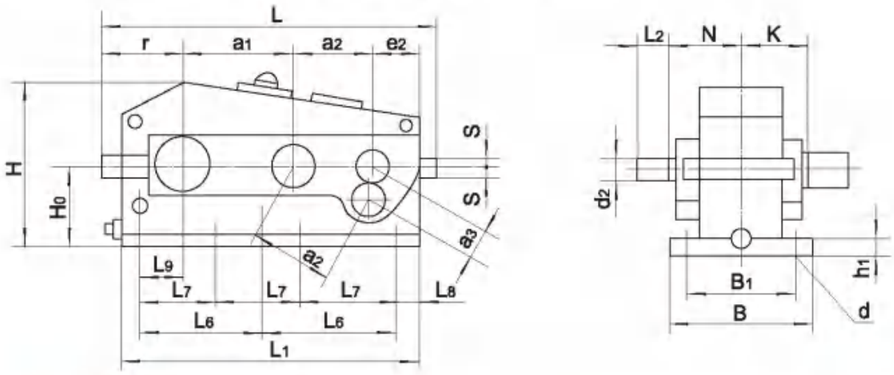
名义中心距 a_1 Nominal center distance	a_2	a_3	a_{03}	i=22.4～71		i=80～100		L	H	N	K	r	e_2	S	H_0	L_1	B	h_1	B_1	L_7	L_8	L_9	d	重量 Weight (kg)
				d_{2r6}	L_2	d_{2r6}	L_2																	
170	118	85	373	25	42	20	36	724	410	140	165	202	119.5	22	200	665	315	32	260	190	47.5	125	M16	230
200	140	100	440	32	58	22	36	794	452.5	180	195	232	97.5	27	225	745	355	40	300	210	57.5	150	M20	270
236	170	118	524	38	58	28	60	976	509	210	225	318	63.5	27	250	835	445	40	380	230	72.5	175	M20	604
280	200	140	620	48	82	38	80	1105	607	235	250	325	120	32	315	1025	500	50	430	285	85	200	M24	715
				i=20～56		i=63～100																		
				d_{2r6}	L_2	d_{2r6}	L_2																	
335	236	170	741	55	82	42	82	1265	722.5	260	280	375	79	37	355	1125	540	63	480	315	90	215	M30	1560
370	260	185	815	60	105	48	82	1380	802	280	310	410	97	37	400	1264	610	63	540	350	107	245	M30	1715
400	280	200	880	65	105	55	90	1544	933.5	310	340	447	155	37	450	1420	690	80	590	400	110	275	M36	1852
450	320	225	995	70	105	60	105	1742	995	350	375	506	175	42	500	1610	750	80	650	450	130	310	M36	2517
500	360	250	1110	80	130	65	105	1938	1125	370	410	554	200	42	560	1790	830	100	710	500	145	335	M42	3610
560	400	280	1240	95	170	75	120	2190	1265	390	460	626	235	47	630	2010	910	100	790	560	165	370	M42	4845
630	450	320	1400	110	180	85	130	2458	1400	440	495	704	255	47	710	2260	1030	125	890	630	185	420	M48	6840
710	500	360	1570	120	210	90	170	2752	1570	520	565	781	295	55	800	2540	1160	125	1000	710	205	470	M48	10260
800	560	400	1760	140	250	100	180	3100	1790	575	645	880	335	55	900	2850	1320	160	1140	800	225	530	M56	13300

*键槽按GB1095-79　　* Keyway in accordance with GB1095-79

** 空心轴有关尺寸见表24　　** Hollow shaft dimensions see talbe 24

7) 表22　QJYD23减速器外形及安装尺寸 (mm)

Table 20: External and installation dimension for type QJYD23 decelerator (mm)



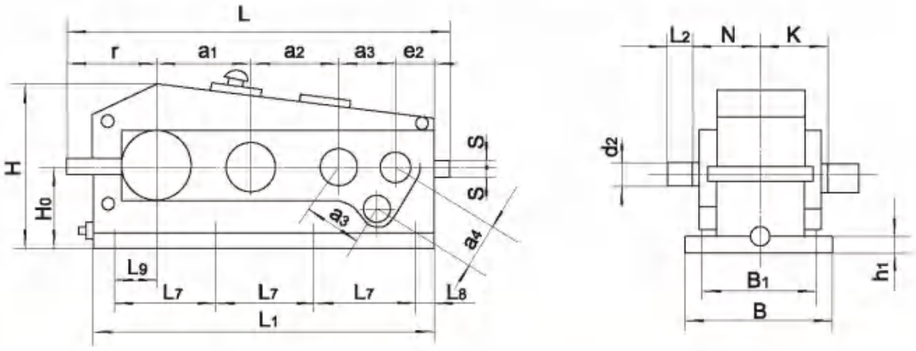
名义中心距 a_1 Nominal center distance	a_2	a_3	a_{03}	i=22.4～71		i=80～100		L	H	K	S	r	e_1	N	H_0	L_1	B	h_1	B_1	L_6	L_7	L_8	L_9	d	重量 Weight (kg)
				d_{2r6}	L_2	d_{2r6}	L_2																		
170	118	85	373	25	42	20	36	655	420	165	22	202	127	140	205	580	300	32	250	245	-	45	120	M16	141
200	140	100	440	32	58	22	36	714	445	195	27	232	117.5	180	225	665	355	40	300	280	-	52.5	155	M20	260
236	170	118	524	38	58	28	60	890	500	225	27	272	182	210	250	830	405	40	350	350	-	65	177	M20	406
280	200	140	620	48	82	38	80	978	562	250	32	314	145	235	315	920	500	50	430	380	-	80	205	M24	640
				i=20～56		i=63～100																			
				d_{2r6}	L_2	d_{2r6}	L_2																		
335	236	170	741	55	82	42	82	1225	710	280	37	375	211.5	260	355	1090	550	63	505	450	-	95	212.5	M30	959
370	260	185	815	60	105	48	82	1350	770	310	37	410	228.5	280	400	1187	620	63	520	493.5	-	100	228.5	M30	1169
400	280	200	880	65	105	55	90	1404	836	340	37	447	215	310	450	1280	690	80	590	520	-	120	265	M36	1645
450	320	225	995	70	105	60	105	1582	980	375	42	506	240	350	500	1450	750	80	650	-	400	125	315	M36	2328
500	360	250	1110	80	130	65	105	1748	1060	410	42	554	260	370	560	1600	830	100	710	-	440	140	340	M42	3230
560	400	280	1240	95	170	75	120	1942	1240	460	47	626	265	390	630	1760	910	100	790	-	490	145	390	M42	4370
630	450	320	1400	110	180	85	130	2178	1370	495	47	704	295	440	710	1980	1010	125	870	-	540	180	425	M48	6080
710	500	360	1570	120	210	90	170	2432	1530	565	55	781	335	520	800	2220	1100	125	950	-	610	195	480	M48	8360
800	560	400	1760	140	250	100	180	2730	1760	645	55	880	375	575	900	2500	1320	160	1140	-	680	230	535	M56	11875

*键槽按GB1095-79　　* Keyway in accordance with GB1095-79

** 空心轴有关尺寸见表24　　** Hollow shaft dimensions see talbe 24

8) 表23　QJYD34减速器外形及安装尺寸 (mm)

Table 23: External and installation dimension for type QJYD34 decelerator (mm)



名义中心距 a_1 Nominal center distance	a_2	a_3	a_4	a_{04}	i=100～140		i=160～280		i=315～400		L	H	N	K	r	e_2	S	H_0	L_1	B	h_1	B_1	L_7	L_6	L_9	d	重量 Weight (kg)
					d_{2r6}	L_2	d_{2r6}	L_2	d_{2r6}	L_2																	
170	118	85	63	436	20	35	20	35	16	30	724	405	140	165	202	119.5	22	200	665	315	32	260	190	47.5	125	M16	230
200	140	100	70	510	22	35	22	35	20	35	794	452.5	180	195	232	97.5	27	225	745	355	40	300	210	57.5	150	M20	270
236	170	118	90	614	25	40	25	40	22	35	976	509	210	225	318	63.5	27	250	835	445	40	380	230	72.5	175	M20	640
280	200	140	100	720	28	50	28	50	25	40	1105	607	235	250	325	120	32	315	1025	500	50	430	285	85	200	M24	715
335	236	170	118	859	35	60	28	50	25	40	1265	722.5	260	280	375	79	37	355	1125	540	63	480	315	90	215	M30	1560
370	260	185	130	945	38	70	35	60	28	50	1380	802	280	310	410	97	37	400	1264	610	63	540	350	107	245	M30	1715
400	280	200	140	1020	42	70	38	70	35	60	1544	933.5	310	340	447	155	37	450	1420	690	80	590	400	110	275	M36	1852
450	320	225	160	1153	48	80	42	70	38	70	1742	995	350	375	506	175	42	500	1610	750	80	650	450	130	310	M36	2517
					i=100～180		i=200～250		i=280～400																		
					d_{2r6}	L_2	d_{2r6}	L_2	d_{2r6}	L_2																	
500	360	250	180	1290	48	80	42	70	38	70	1938	1125	370	410	554	200	42	560	1790	830	100	710	500	145	335	M42	3610
560	400	280	200	1440	60	105	55	90	48	80	2190	1265	390	460	626	235	47	630	2010	910	100	790	560	165	370	M42	4845
630	450	320	225	1625	65	105	60	105	48	80	2458	1400	440	495	704	255	47	710	2260	1030	125	890	630	185	420	M48	6840
710	500	360	250	1820	75	120	65	105	55	90	2752	1570	520	565	781	295	55	800	2540	1160	125	1000	710	205	470	M48	10260
800	560	400	280	2040	80	140	70	120	65	105	3100	1790	575	645	880	335	55	900	2850	1320	160	1140	800	225	530	M56	13300

*键槽按GB1095-79　　* Keyway in accordance with GB1095-79

** 空心轴有关尺寸见表24　　** Hollow shaft dimensions see talbe 24

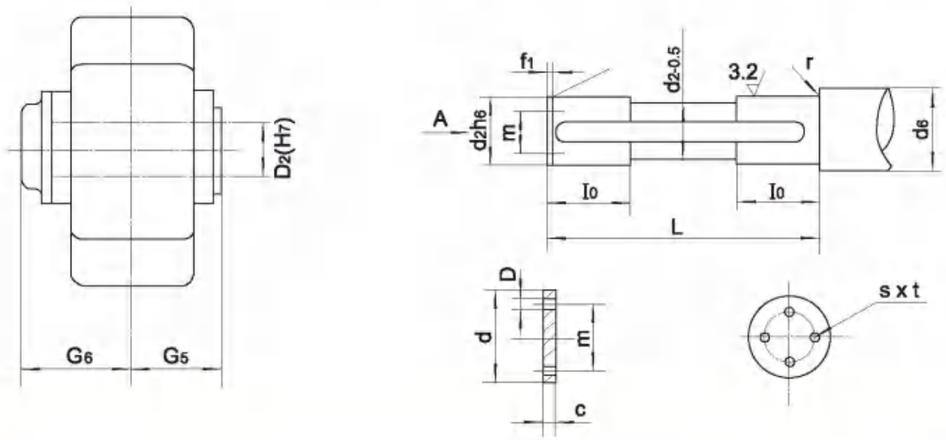
TAILONG MACHINERY

9）表24　空心轴型减速箱（键联接）的连接尺寸

Table 24: External and installation dimension of hollow shaft type decelerator (key connection) (mm)

工作机轴上联接部分的尺寸

Dimension of the upper connection of the working machine shaft



齿轮箱型号 Gearbox type			轴端尺寸 Shaft end dimension													
			空心轴 Hollow shaft			工作机轴 Working machine shaft							端板 End plate			
QJYA2	QJYA3 QJYA23	QJYA34	规格 Specification													
			D_2	G_5	G_6	d_2	d_6	f_1	L	l_0	r	s	t	C	D	d	m
140			70	146	184	70	80	4	290	40	2.5	10	17	8	11	86	50
170	170	170	90	155	195	90	100	4	308	40	2.5	10	17	10	11	100	60
200	200	200	100	167	207	100	110	5	332	50	4	10	17	10	11	120	70
236	236	236	120	190	232	120	130	5	378	50	4	12	20	12	14	140	80
280	280	280	140	215	257	140	150	5	428	65	4	12	20	12	14	160	90
335	335	335	160	245	298	160	170	6	488	65	4	12	20	23	14	180	90
370	370	370	180	275	328	180	190	6	548	75	4	12	20	23	14	200	90
400	400	400															
450	450	450															
500	500	500															
560	560	560															
630	630	630															
710	710	710															
800	800	800															

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键槽按GB1095–79　　Keyway in accordance with GB1095–79

TAILONG MACHINERY

8、许用功率表 Table of allowed power

1）表25　QJY2、QJYD2、QJYA2高速轴许用功率表

Table 25: Allowable power for type QJY2, QJYD2, QJYA2 high-speed shaft

名义中心距 Nominal center distance (mm)	输出扭矩 Output torque (Nm)	输入轴转速 Input shaft rotating speed (r/min)	公称传动比i Nominal transmission ratio i										
			6.3	7.1	8	9	10	11.2	12.5	14	16	18	20
			许用功率P Allowed power P (kW)										
		750	19.4	17.2	15.3	13.6	12.2	10.9	9.8	8.7	7.7	6.8	6.1
140	1550	1000	25.9	23	20.4	18	16.3	14.6	13	11.7	10.2	9	8.2
		1500	38.8	34.5	30.6	27.2	24.5	21.8	19.6	17.5	15.3	13.6	12.2
		750	32.2	28.6	25.4	22.5	20.3	18	16.2	14.5	12.7	11.3	10
170	2585	1000	42.9	38.1	33.8	30	27	24	21.6	19.3	16.9	15	13.5
		1500	64.4	57.2	50.7	45	40.6	36.2	32.5	29	25.4	22.5	20.3
		750	62.8	55.7	49.4	43.9	39.5	35.3	31.6	28.2	24.7	22	19.8
200	5035	1000	83.7	74.3	65.9	58.6	52.7	47	42.2	37.7	35	29.3	26.4
		1500	125.5	111.4	98.9	87.9	79	70.6	63.3	56.5	49.4	43.9	39.5
		750	106.6	94.6	83.9	74.6	67.1	60	53.7	48	42	37.3	33.6
236	8550	1000	142.1	126	111.9	99.5	89.5	79.9	71.6	63.9	56	49.7	44.8
		1500	213.2	189	167.9	149.2	134.3	119.9	107.4	95.9	83.9	74.6	67.1
		750	177.6	157.6	139.9	124.3	111.9	99.9	89.5	79.9	69.9	62.2	56
280	14250	1000	236.8	210	186.5	165.8	149.2	133.2	119.4	106.6	93.3	82.9	74.6
		1500	355.3	315.2	279.8	248.7	223.8	199.8	179	159.9	139.9	124.3	111.9
		750	296	262.7	233	207.3	186.5	166.5	149.2	133.2	116.6	103.6	93.3
335	23750	1000	394.7	350.3	311	276.3	248.7	222	199	177.6	155.4	138	124.3
		1500	592	525.4	466.3	414.5	373	333	298.4	266.5	233	207	186.5
		750	391	347	308	273.8	246.5	220	197.2	176	154	136.9	123.2
370	31380	1000	521.6	462.8	410.7	365	328.6	293.4	262.9	234.7	205.4	182.6	164.3
		1500	782	694.2	616	547.7	492.9	440	394	352	308	273.8	246.4
		750	502	445.6	395.4	351.5	316.3	282.4	253	226	197.7	175.7	
400	40280	1000	669.5	594	527.2	468.6	421.8	376.6	337.4	301.3	263.6	234.3	
		1500	1004	891	790.8	703	632.7	564.9	506	451.9	395.4	351.5	
		750	710.6	630.5	559.6	497.4	447.7	399.7	358	319.8	279.8	248.7	
450	57000	1000	947.4	841	746	663	597	532.9	477.5	426	373	331.6	
		1500	1421	1261	1119	995	895	799.4	716.2	639.5	559.6	497.4	
		750	1007	893	792.7	704.6	634	566	507	453	396.4	352	
500	80750	1000	1342	1191	1057	939.5	845.5	755	676.4	604	528.5	469.7	
		1500	2013	1786	1585	1409	1268	1132	1014.7	906	792.7	704.6	
		750	1421	1261	1119	994.8	895	799.4	716	639.5	559.6	497	
560	114000	1000	1895	1681	1492	1326	1194	1065.8	955	853	746	663	
		1500	2842	2522	2238	1989.5	1791	1598.7	1433	1279	1119	994.8	
		750	2013	1786	1585	1409	1268	1132	1014.7	906	792.7	704.6	
630	161500	1000	2684	2382	2113.9	1879	1691	1510	1353	1208	1057	939.5	
		1500								1812	1585	1409	
		750	2795	2480	2201	1956	1761	1572	1409	1258	1105	978	
710	224200	1000	3726	3307	2935	2608	2348	2096	1878	1677	1467	1304	
		1500								2515	2201	1956	
		750	4027	3573	3171	2819	2537	2265	2029	1812	1585	1409	
800	323000	1000	5369	4764	4228	3758	3382	3020	2706	2416	2114	1879	
		1500											

＊工作级均为M_5　Working stage is M_5 for all

2) 表26　QJY3、QJY23、QJYD3、QJYA3高速轴许用功率表

Table 26: Allowable power for type QJY3, QJY23, QJYD3, QJYA3 high-speed shaft

公称中心距 Nominal center distance (mm)	输出扭矩 Output torque (Nm)	输入转速 Input shaft rotating speed (r/min)	公称传动比 Nominal transmission ratio i										
			20	22.4	25	28	31.5	40	45	50	63	80	90	100
			许用功率P Allowed power P											
		750		9.06	8.12	7.25	6.44	5.07	4.5	4.05	3.22	2.54	2.25	2.03
170	2585	1000		12.1	10.8	9.7	8.6	6.8	6.0	5.4	4.3	3.4	3.0	2.7
		1500		18.1	16.2	14.5	12.9	10.1	9.0	8.1	6.4	5.1	4.5	4.1
		750		17.7	15.8	14.1	12.6	9.9	8.8	7.9	6.3	4.9	4.4	3.9
200	5035	1000		23.5	21.1	18.8	16.7	13.2	11.7	10.5	8.4	6.6	5.9	5.3
		1500		35.3	31.6	28.2	25.1	19.8	17.6	15.8	12.6	9.9	8.8	7.9
		750		29.98	269.9	23.9	21.3	16.8	14.9	13.4	10.7	8.4	7.5	6.7
236	8550	1000		39.96	35.8	31.97	28.4	22.4	19.9	17.9	14.2	11.2	9.9	8.95
		1500		59.95	53.7	47.96	42.6	33.6	29.8	26.9	21.3	16.8	14.9	13.4
		750		49.96	44.8	40.0	35.5	27.9	24.9	22.4	17.8	14.1	12.4	11.15
280	14250	1000		66.6	59.7	53.3	47.4	37.3	33.2	29.8	26.9	21.2	18.8	16.9
		1500		99.9	89.5	79.9	71.1	56.0	49.7	44.8	35.5	28.0	24.9	22.4
		750		83.3	74.6	66.6	59.2	46.6	41.4	37.3	29.6	23.3	20.7	18.7
335	23750	1000		111.0	99.5	88.8	78.9	62.2	55.3	49.7	39.5	31.1	27.6	24.9
		1500		166.5	149.2	133.2	118.4	93.3	82.9	74.6	59.2	46.6	41.4	37.4
		750		110.0	98.6	88.0	78.2	61.6	57.8	49.3	39.1	30.8	27.4	24.6
370	31380	1000		146.7	131.4	117.4	104.3	82.1	73.0	65.7	52.2	41.1	36.5	32.9
		1500		220.0	197.2	176.0	156.5	123.2	109.5	98.6	78.2	61.6	54.8	49.3
		750	158.2	141.2	126.5	113.0	100.4	79.1	70.3	63.6	50.2	39.5	35.1	
400	40280	1000	210.9	188.3	168.7	150.6	133.9	105.4	93.7	84.4	66.9	52.7	46.9	
		1500	316.3	282.4	253.1	226.0	200.8	158.2	140.6	126.5	100.4	79.1	70.3	
		750	223.8	199.8	179.1	159.8	142.1	111.9	99.5	89.5	71.1	56.0	49.7	
450	57000	1000	298.4	266.5	238.7	213.2	189.5	149.2	132.6	119.4	94.7	74.6	66.3	
		1500	447.6	399.7	358.1	319.7	284.2	223.8	199.0	179.1	142.1	111.9	99.5	
		750	317.1	283.1	253.7	226.5	201.3	158.5	140.9	126.8	100.7	79.3	70.5	
500	80750	1000	422.8	377.5	338.2	302.0	268.4	211.4	187.9	169.1	134.2	105.7	93.9	
		1500	634.2	566.2	507.3	453.0	402.6	317.1	281.8	253.7	201.3	158.5	140.9	
		750	447.6	399.7	358.1	319.7	284.2	223.8	199.0	179.1	142.1	111.9	99.5	
560	114000	1000	596.9	532.9	477.5	426.3	379.0	298.4	265.3	238.7	189.5	149.2	132.6	
		1500	895.3	799.4	716.2	639.5	568.4	447.6	397.9	358.1	284.2	223.8	199.0	
		750	634.2	566.2	507.3	453.0	402.6	317.1	281.8	253.7	201.3	158.5	140.9	
630	161500	1000	845.5	754.9	676.4	604.0	536.9	422.8	375.8	338.2	268.4	211.4	187.9	
		1500	1268.3	1132.4	1014.7	905.9	805.3	634.2	563.7	507.3	402.6	317.1	281.8	
		750	880.4	786.0	704.3	628.8	559.0	440.2	391.2	352.1	279.5	220.1	195.6	
710	224200	1000	1173.8	1048.1	939.1	838.4	745.3	586.9	521.7	469.5	372.6	293.6	260.8	
		1500	1760.7	1572.1	1408.6	1257.7	1117.9	880.4	782.5	704.3	559.0	440.2	391.3	
		750	1268.3	1132.4	1014.7	905.9	805.3	634.2	563.7	507.3	402.6	317.1	281.8	
800	323000	1000	1691.1	1509.9	1352.9	1207.9	1073.7	845.5	751.6	676.4	536.9	422.8	375.8	
		1500	2536.6	2264.9	2029.3	1811.9	1610.6	1268.3	1127.4	1014.7	805.3	634.2	563.7	

* 工作级均为M_5　Working stage is M_5 for all

3) 表27　QJY34、QJYD34、QJYA34高速轴许用功率表

Table 27: Allowable power for type QJY34, QJYD34, QJYA34 high-speed shaft

公称中心距 Nominal center distance (mm)	输出扭矩 Output torque (Nm)	输入转速 Input shaft rotating speed (r/min)	公称传动比 Nominal transmission ratio i										
			100	125	140	160	200	224	250	280	315	335	400
			许用功率P Allowed power P										
		750		1.623	1.45	1.27	1.01	0.91	0.81	0.72	0.64	0.61	0.51
170	2585	1000		2.16	1.93	1.69	1.35	1.21	1.08	0.97	0.86	0.81	0.68
		1500		3.25	2.90	2.54	2.03	1.81	1.62	1.45	1.29	1.21	1.01
		750		3.16	2.82	2.47	1.98	1.77	1.58	1.41	1.26	1.18	0.99
200	5035	1000		4.22	3.77	3.30	2.64	2.35	2.11	1.88	1.67	1.57	1.32
		1500		6.33	5.65	4.94	3.95	3.53	3.16	3.82	2.51	2.36	1.98
		750		5.37	4.80	4.20	3.35	2.30	2.69	2.40	2.13	2.00	1.68
236	8550	1000		7.16	6.39	5.60	4.48	3.00	3.58	3.20	2.84	2.67	2.24
		1500		10.74	9.59	8.39	6.71	6.00	5.37	4.80	4.26	4.01	3.36
		750		8.95	7.99	6.99	5.60	5.00	4.48	4.00	3.55	3.34	2.80
280	14250	1000		11.94	10.66	9.33	7.46	6.66	5.97	5.34	4.74	4.45	3.73
		1500		17.90	15.99	13.99	11.20	10.00	8.95	8.00	7.11	6.68	5.60
		750		14.92	13.3	11.7	9.3	8.3	7.5	6.7	5.9	5.6	4.7
335	23750	1000		19.9	17.8	15.5	12.4	11.1	9.9	8.9	7.9	7.4	6.2
		1500		29.8	26.6	23.3	18.7	16.7	14.9	13.3	11.8	11.1	9.3
		750		19.7	17.6	15.4	12.3	11.0	9.7	8.8	7.8	7.4	6.2
370	31380	1000		26.3	23.5	20.5	16.4	14.7	13.1	11.7	10.4	9.8	8.2
		1500		39.4	35.2	30.8	24.6	22.0	19.7	17.6	15.6	14.7	12.3
		750	31.6	25.3	22.6	19.8	15.8	14.1	12.7	11.3	10.0	9.4	7.9
400	40280	1000	42.2	33.7	30.1	26.4	21.0	18.8	16.9	15.1	13.4	12.6	10.5
		1500	63.2	50.6	45.2	39.5	31.6	28.2	25.3	22.6	20.1	18.9	15.8
		750	44.8	35.8	32.0	28.0	22.4	20.0	17.9	16.0	14.2	13.4	11.2
450	57000	1000	59.7	47.7	42.6	37.3	29.8	26.6	23.9	21.3	18.9	17.8	14.9
		1500	89.5	71.6	63.9	56.0	44.8	40.0	35.8	32.0	28.4	26.7	22.4
		750	63.4	50.7	45.3	39.6	31.7	28.3	25.4	22.6	20.1	18.9	15.9
500	80750	1000	84.6	67.6	60.4	52.8	42.3	37.7	33.8	30.2	26.8	25.2	21.1
		1500	126.8	101.5	90.6	79.3	63.4	56.6	50.7	45.3	40.3	37.9	31.7
		750	89.5	71.6	63.9	56.0	44.8	40.0	35.8	32.0	28.4	26.7	22.3
560	114000	1000	119.4	95.5	85.3	74.6	59.7	53.3	47.7	42.6	37.9	35.6	29.8
		1500	179.1	143.2	127.8	111.9	89.5	80.0	71.6	63.9	56.8	53.5	44.8
		750	126.8	101.5	90.6	79.3	63.4	56.6	50.7	45.3	40.3	37.9	31.7
630	161500	1000	169.1	135.3	120.8	105.7	84.6	75.5	67.6	60.4	53.7	50.5	40.3
		1500	253.7	202.9	181.2	158.5	126.8	113.2	101.5	90.6	80.55	75.7	63.4
		750	176.1	140.9	125.8	110.0	88.0	78.6	70.4	62.9	55.9	52.6	44.0
710	224200	1000	234.8	187.8	176.7	146.7	117.3	104.8	93.9	83.8	74.5	70.1	58.7
		1500	352.1	281.7	251.5	220.1	176.1	157.2	140.9	125.8	111.8	105.1	88.0
		750	253.7	202.9	181.2	158.5	126.8	113.2	101.5	90.6	80.5	75.7	63.4
800	323000	1000	338.2	270.6	241.6	211.4	169.1	151.0	135.3	120.8	107.4	101.0	84.6
		1500	507.3	405.8	362.4	317.1	253.1	226.5	202.9	181.2	161.1	151.4	126.8

* 工作级均为M_5　Working stage is M_5 for all

4) 表28 机构利用等级 Table 28: Degree of utilization of machanvism

机构利用分级 Degree of utilization	总设计寿命(h) Total life time of design	说明 Remark
T_0	200	
T_1	400	不经常使用 Not often use
T_2	800	
T_3	1600	
T_4	3200	经常轻闲使用 Often use light duty
T_5	6300	经常中等使用 Often use medium duty
T_6	12500	不经常繁忙使用 Not often use heavy duty
T_7	25000	
T_8	50000	繁忙使用 Heavy duty
T_9	100000	

5) 表29 机构工作级别 Table 29: Mechanism Operating Mode

载荷状态 Load	说 明 Remark	机构利用等级 Degree of utidization									
		T_0	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9
L_1–轻 L_1-Light	机构常受轻载荷，偶尔受最大载荷 Often use for light load, occationally heaviest load			M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8
L_2–中 L_2-Medium	机构常受中等载荷，较少受最大载荷 Often use for medium load, little time heaviest load		M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8	
L_3–重 L_3-Heavy	机构常受较重载荷，也常受最大载荷 Often use for heavy load, sometime heaviest load	M_1	M_2	M_3	M_4	M_5	M_6	M_7	M_8		
L_4–特重 L_4-Exera heavy	机构常受最大载荷 Often use for lheaviest load	M_2	M_3	M_4	M_5	M_6	M_7	M_8			

6) 表30 ϕ_2的计算式 Table 30: Calculation of ϕ_2

起重机类别 Kind of lifting equipment	ϕ_2的计算式 Calculation of ϕ_2	适用的例子 Example
1	1+0.17V	作安装用的、使用轻闲的臂架起重机 Boom Crane for in stallation, light duty
2	1+0.35V	作安装用的、桥式起重机，作一般装卸用的吊钩式臂架起重机 Bridge crane for installation, Boom crane with hook for handing
3	1+0.70V	在机加工车间和仓库中用的吊钩式起重机，港口抓斗门座起重机 Elecric hook Crane for workshop or Warehouse, Harbour protal crare with grab bucket
4	1+1.00V	抓斗和电磁桥式起重机 Bridge crane with grab bucket and electric magnetic disk

V: 起重机提升速度（米/秒） V: Lifting speed, m/sec

7) 表31 轴伸中间部位允许的最大径向载荷
Table 31: Allowable max Overhomg load, radially (单位：KN)

名义中心距 a_1 Nominal centre distance a_1	140	170	200	236	280	335	370	400	450	500	560	630	710	800
二级 2 stage	9	15	21	28	35	43	55	60	75	100	107	120	150	100
三级和四级 3, 4 stage	9	15	28	35	48	55	64	93	120	150	170	200	240	260

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9、选用方法

1) QJY2、QJYD2、QJYA2减速器的承载能力（工作级别M_5）应符合表25的规定。

2) QJY3、QJY23、QJYD3、QJYA3、QJTY23减速器的承载能力（工作级别M_5）应符合表26的规定。

3) QJY34、QJYD34、QJYA34减速器的承载能力（工作级别M_5）应符合表27的规定。

4) 减速器输出轴中间部位最大允许径向载荷（当n=950r/min）见表31。减速器输出轴端的瞬时，允许转矩为额定输出转矩的2.7倍。

5) 若用在其它工作级别时，表25、26、27值应按公式B1进行折算：

$$PM_5=PM_i \times 1.12^{i-5} \quad \text{(B1)}$$

PM_5——功率表中的数值，kw

i——工作级中1~8

PM_i——相对M_i工作级别的功率值，kw

各种起重机工作级别的确定见表28和表29

6) 起重机减速器选型计算：

6.1) 起重机各机构疲劳计算基本载荷M_{max}。

6.1.2) 起升和非平衡交幅机构；

$$M_{max}=\phi_6 M_n \quad \text{(B2)}$$

式中： P_6——动载系数

$$\phi_6=\frac{1}{2}(1+\phi_2) \quad \text{(B3)}$$

M_n——电机额定转矩 Nm

ϕ_2——起升载荷系数（按表30计算确定）

6.1.3) 运行和回转机构；

$$M_{max}=\phi_8 M_n \quad \text{(B4)}$$

式中：ϕ_8——刚性动载系数，ϕ_8=1.2–2.0

6.1.4) 平衡变幅机构；

M_{max}取为该零件承受的等效变幅静阻力矩，其它零件取为电动机额定力矩传到该计算零件力矩的1.3~1.4倍。

当最大工作载荷低于2.7倍的额定力矩时可不进行静强度校核，当最大承载荷超过2.7倍的额定力矩时，应验算零件的静强度或者选大一号机座的减速箱。

6.2) 根据疲劳计算基本载荷和转送换算出功率值PM_i。

$$PM_i=\frac{M_{max} \cdot n}{9550} \quad \text{(B5)}$$

式中：M_{max}——疲劳计算基本载荷，Nm；

n——减速器输入轴转速，r/min。

如果工作级别不是M_5，按公式(B1)进行换算至M_5工作级别时的功率PM_5。然后根据P及公称传动比i选择减速器。

7) 选用举例：

选一台起重量为32t，跨度为25.5M的桥式起重机，其起升机构的电机额定功率为60kw，转速为750r/min，起升速度为8m/min，机构工作级别为M_7，减速器的传动比为40，要求第Ⅲ种装配型式，齿轮轴端，立式安装。

电机的额定转矩

$$M_n=9550\times\frac{P}{n}=9550\times\frac{60}{750}=764Nm$$

起升载荷系数（按表30）

$$\varnothing_2=1+0.7V=1+0.7\times\frac{8}{60}=1.093$$

动载系数

$$\varnothing_6=\frac{1}{2}(1+\varnothing_2)=\frac{1+1.093}{2}=1.047$$

疲劳计算基本载荷：

$$M_{max}=\varnothing_6\cdot M_n=1.047\times764.8=800Nm$$

相对于M_7工作级别的功率：

$$FM_7=\frac{M_{max}\cdot n_1}{9550}=\frac{800\times750}{9550}=62.82kw$$

再折算成M_5时的功率

$$PM_5=PM_1\times1.12^{(7-5)}=78.8kw$$

查表26：

当n=750r/min，i=40时名义中心距400，则高速轴许用功率PM_5为79.1kw＞78.8kw最后选定；

QJY3400-40ⅢCL

Selection method:

1) Carrying capacity of type QJY2, QJYD2, QJYA2 decelerators (working grade M_5) should meet the requirement in table 25.
2) Carrying capacity of type QJY3, QJY23, QJYD3, QJYA3, QJTY23 decelerators (working grade M_5) should meet the requirement in talbe 26.
3) Carrying capacity of type QJY34, QJYD34, QJYA34 decelerators (working grade M_5) should meet the requirement in table 27.
4) See table 31 for the allowable maximum radial loading at the center of the output shaft of the output shaft of decelerator. The instantaneous allowable torque of output shaft end of decelerator is 2.7 times of the rated output torque.

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5) When used in the other working grade, the value in the table 25, 26, and 27 should be calculated according to the formula B1:

$$PM_5=PM_1\times1.12^{i-5} \quad (B1)$$

PM_5——Value in the table of power, kw

i——Working grade 1~8

PM_i——Value of power relative to the working grade M_i, kw

See table 28 and table 29 for the calculation of working grade for various hoists.

6) Calculation for selecting hoist decelerator

6.1) Fatigue calculated basic load of each mechanism of the hoist Maxz o

6.1.2) Hoisting and non-equilibrium alternating amplitude mechanism

$$M_{max}=\varnothing_6 M_n \quad (B2)$$

In which: P_6——dynamic loading factor

$$\varnothing_6=\frac{1}{2}(1+\varnothing_2) \quad (B3)$$

M_n——rated torque of motor, Nm

$\varnothing_2$——hoisting loading factor (determined by the calculation with talbe 30)

6.1.3) Running and rotary mechanism

$$M_{max}=\varnothing_8 M_n \quad (B4)$$

In which:$\varnothing_8$——rigid dynamic loading factor, $\varnothing_8$=1.2-2.0

6.1.4) Equilibrium variable amplitude mechanism

M_{max} is the equivalent variable amplitude static resistance moment carried by the part. For other parts, it is 1.3~1.4 times of the motor rated moment that is transferred to the moment of this part.

If maximum working load is less than 2.7 times of the rated moment, the verification of static strength is not needed. If maximum loading exceeds 2.7 times of the rated moment, the static strength of the part should be verified or the decelerator with the base larger by one size should be selected.

6.2) Convert to the value of power PM_i according to the fatigue-calculated basic loading and transmission

$$PM_i=\frac{M_{max}\cdot n}{9550} \quad (B5)$$

In which: M_{max}——fatigue calculation basic loading, Nm;

n——input shaft rotating speed of decelerator, r/min

If the working grade is not M_5, convert to the value of power PM_5 at working grade of M_5 according to the formula B1. And then select decelerator based on P and nominal transmission ratio i.